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DETROIT BUREAU OF
GOVERNMENTAL RESEARCH, INC.
100 GRISWOLD STREET

REPORT
ON
ORGANIZATION AND ADMINISTRATION
of the
ENGINEERING AND JANITORIAL SERVICE
of the
BOARD OF EDUCATION
CITY OF DETROIT

Prepared by the
DETROIT BUREAU OF GOVERNMENTAL RESEARCH, INC.
January, 1917.

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FOREWORD

This report is a study of the organization and administration of the engineering and janitorial service of the Board of Education, and is not intended as an exhaustive report on the effectiveness of the service. Its purpose is to suggest lines of work which may be followed in order to bring about more efficient and economical results in the operation of the school buildings.

It is realized that the faulty conditions which have been found in the organization and administration of this branch of the service are the results of cumulative shortcomings in management covering a long period of years, and that the Board of Education, as constituted at present, is not responsible for the creation of these defects.

Further, in fairness to many of the present members of the Board, it must be stated that they have been aware of the existence of conditions as set forth in this report and have tried to remedy them. Those efforts have, however, for one reason or another met with little encouragement and success in the past.

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1. INTRODUCTORY STATEMENT

From a financial standpoint, the importance of the janitorial and engineering service of the Department of Education is reflected in the following table:

	Expended 1915-1916	Allowed 1916-1917	Requested 1917-1918
Salaries - Janitors and Engineers	$331,386.84	$425,153.13	$498,119.67
Supplies	7,708.37	8,500.00	12,000.00
Fuel	77,224.70	90,000.00	162,967.50
Totals	$416,319.91	$523,653.13	$673,087.17

Approximately 400 men and women are employed in this service, divided into the following grades:

Chief Engineer	Engineers with a first class license employed in high schools and in elementary schools on a high school basis; in charge of the heating and ventilating plant.
Assistant Engineer	Men with a first class license; work under the Chief Engineers in high schools.
Engineer-Janitor	Engineers with a first class license employed in elementary schools, heated by steam; are responsible for the entire operation of the building. They have janitors to assist them during the ten months when school is in session.

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Fuel	77,724.70	90,000.00	1[illegible]
Totals	$416,319.91	$[illegible],[illegible].15	$[illegible]

[illegible] 400 men [illegible] service, divided [illegible]

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Assistant Engineer	Men with [illegible] under the Chief Engineer [illegible] schools.
Engineer-Janitor	Engineers [illegible] employed in elementary schools, [illegible] by steam; are [illegible] time operation [illegible] have [illegible] the ten months when [illegible] sion.

Firemen or Coal Passers	Non-licensed; employed for the whole year in the high schools and in elementary schools on a high school basis.
Chief Janitor	In high schools and in elementary schools on a high school basis chief janitors are responsible for the cleaning of the building.
Janitor	In schools which are heated by furnaces, janitors are in entire charge of the building,- heating and cleaning. Employed for entire year.
Assistant Janitor	Work under the chief janitors; employed for the whole year.
Janitress	Employed in high schools and in elementary schools on a high school basis, to assist in cleaning; employed for ten months.

2. EMPLOYMENT OF JANITORS AND ENGINEERS

a. Appointments

> "Engineers and janitors of primary and grammar schools, janitors and janitresses of high schools shall be appointed on the nomination of the Supervisor of School Property to the Committee on Supplies and Janitors, and confirmed by the Board of Education."

In actual practice the appointment of janitors and engineers follow a procedure which departs radically from that prescribed in the by-laws.

By custom long established, the Inspectors have the privilege of recommending for appointment persons for janitorial and engineering positions in schools in their respective wards. Such recommendations, submitted to the Committee on Janitors and Supplies, are without exception acted upon favorably.

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The Supervisor, who under the by-laws is supposed to recommend employees for appointment, is told whom to put to work and where to assign them.

Even in the elementary schools where the engineer-janitors are given the power under the by-laws to hire their assistants to help them care for the school, the Inspectors make the appointments.

b. Probation

> "All appointments of janitors and engineers shall in the first instance be on probation for six months. At the end of that time, the appointee if satisfactory may be confirmed."

As far as can be learned the above rule is ignored. No records are kept of "probationers" nor has it been observed that the Committee on Supplies and Janitors demands reports upon appointees after the six month period has expired. In fact the Board of Education confirms the appointments of the Committee when the appointee begins his service, although it is true the provision is included that such appointment is for a six months probationary period.

c. Suspension and Removals

> "Janitors and engineers are subject to suspension, at any time, by the Committee on Janitors and Supplies, said removals being reported to the Board for action at its next subsequest meeting. Janitors and engineers shall be subject to removal by the Board at any time."

Under the rules prescribing the duties of principals, the latter are required to report to the Business

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Manager any delinquency on the part of janitors and engineers. But here again practise differs from what the rules prescribe. Janitors and engineers, being appointed by the inspector of the ward, are his proteges, and it seems that a principal is loathe to incur the displeasure of an inspector by registering a complaint against the latter's appointee.

No letter of complaint from principals to the Secretary could be found, but according to the latter, he often is apprised of the dereliction of duty by janitors or engineers, and when such is the case, he summons the delinquent and the principal before the Committee, and has the case threshed out.

The Supervisor of Property, who is in direct charge of janitors and engineers, also reports delinquents to the Committee which investigates the case and makes its recommendations to the Board of Education. However, when a case arises against a janitor or engineer, the Inspector interests himself in his appointee and tries to straighten out difficulties. While the Inspector will not insist upon reinstatement if the case against the offender is caused by a flagrant violation, nevertheless, the impression gained was that it is not a simple matter to discharge an undesirable employee. This statement is not based upon records because none are maintained covering this service, but is based upon interviews with various officers of the Board.

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d. Effect of Present System of Employment

The present method of appointing and dismissing janitors and engineers is demoralizing in its effect upon efficiency, and a handicap to economic operation of the school plant.

It seems inevitable that under a system where patronage is to be dispensed in the form of jobs fitness for the position as the primary qualifications of the appointee will not always be demanded. Furthermore, because each man on the staff owes his job to the Inspector, he feels more or less secure so long as he satisfies the Inspector; a condition which is undesirable in a system where effective work depends upon discipline. Principals, as executive officers of the schools and responsible for the proper care of the buildings, also find themselves handicapped in asserting their authority under the circumstances. It is an ordinary occurrence for subordinate janitors or engineers to enlist the aid of their Inspectors in ironing out difficulties with their superiors, or for the superior officers to appeal to Inspectors when finding themselves in difficulties with principals or the Supervisor of Property.

It is not uncommon to hear members of the Committee on Janitors and Supplies at their meetings, discussing the arduousness of the duties of certain employes and condoning with them for the apparent trials which must be endured by such janitors or engineers. This infor-

mation could only be obtained through direct contact between the Inspector and the employee, and by giving a willing ear to such tales, the Inspector demoralizes discipline, and prevents effective work. It is recognized that janitors and engineers may be delinquent or may shirk their duties and shift them to their subordinates, but should such be the case, the matter ought to come to the attention of the executive officer in charge, to be remedied by him and not by Inspectors.

Patronage does not promote economy, whether t use of its power is prompted by political ambition or by philanthropic motives

5. PROMOTIONS

Promotions to better positions in the service are made in the same manner as are the orginal appointments,- upon the recommendation of the inspector of the ward, and not necessarily upon merit. And vacancies in large schools are not always filled by trahsferring janitors and engineers from smaller schools to such positions.

Table Showing Appointments of Chief Janitors and Engineers-Janitors for Year Ending June 30, 1916

To Positions	Appointments by Transfer			New Appointments	Total
	Salary Increased	Salary Decreased	Same Salary		
Chief Engineers	5		4	*11	10
*Chief Janitor	1			10	11
Engineer-Janitor	7	3	4	11	21
Totals	13	3	8	22	42

* Includes two janitors in furnace heated buildings
*' Assistant Engineer, Garfield School

An analysis of the above table shows that of the ten positions of chief janitor vacant, nine could have been used as a means of transferring janitors from smaller schools and advancing assistant janitors to janitors, thus promoting deserving men. The same is true of ten of the positions of engineer-janitor and of the one new appointment of engineer in the Garfield Annex.

The appointment of new men to the larger schools instead of transferring employes from the smaller schools is undesirable, for two reasons: first, because it places new and untrained men in the larger schools with large responsibilities; and, secondly, it serves to destroy the incentive for more efficient work, which comes from having an opportunity for advancement to better positions.

4. SUPERVISION

The Supervisor of Property, assisted by the "boss" plumber and steamfitter, has direct supervision of janitors and engineers. Neither one is a technical man, altho the "boss" plumber is supposed to possess a practical knowledge of boilers. In fact, there is not a technically trained man connected with the service,- one who might take charge of the expensive heating and ventilating systems installed in the schools and supervise it on a modern scientific basis.

In addition to being subject to the orders of the Supervisor of Property, the janitors and engineers, during

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In addition to being subject to the orders of the Supervisor of Property, the janitors and engineers, during

school terms, are subject to the orders of the Principal, who is held responsible for the proper enforcement of all requirements governing duties of janitors and engineers. In case of failure on part of the latter to perform their duties properly, the principal is required to notify the Business Manager. Also, in case of incapacity to attend to their duties, the engineers must notify the Principal and the Business Manager so that substitutes may be supplied.

Members of the Committee on Supplies and Janitors may also receive notifications of engineers who leave the boiler room in charge of assistants.

Supplies for this service, both as to their purchase and use are controlled by the Business Manager's office.

In one way or another, therefore, janitors and engineers are under the jurisdiction of the

Supervisor of Property
Principal of the School
Business Manager of the Board of Education
Committee on Supplies and Janitors

In spite of or because of this multiplicity of supervision and inspection there seems to be no effective control of this branch of the service.

The Supervisor of Property makes his rounds of the schools and inspects them as to the care being taken of them, but only as an incident to his visits to schools on repairing jobs, or else upon special calls or for special reasons. He does not make regular periodic visits to the

schools for the sole purpose of following up the work of the janitors and engineers, and it has been impossible to learn how many times during the year schools are visited and inspected thoroughly as to cleanliness and general sanitary conditions. This is no criticism on the Supervisor of Property, because the time required for supervising maintenance of buildings leaves little opportunity for their supervision of the operation of the buildings.

Not only is the general supervision of the janitorial and engineering staff demoralized because of the manner of appointment, but the basic point of supervision, that of the chief janitors and chief engineers over their subordinates, suffers because of the same reason. The assistant janitors and engineers, apparently, feel on a par with their chiefs so long as they retain the favor of the inspectors. The Chairman of the Committee on Supplies and Janitors stated that inspectors visit schools in order to reprimand refractory subordinates. This does not strengthen the hold of the chief on his subordinates, nor does it insure effective work in caring for the schools.

Control of janitors and engineers by principals must of necessity be negative, even under the most favorable conditions, as they can only inspect the condition of the building and report shortcomings in the operation. Principals interviewed stated that they had no difficulty in getting good service, but the impression gained from interviews with officers of the Board of Education was that principals were reluctant to report delinquencies because of the

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janitors' and engineers' connections with the Inspectors. The point of this is that there must be positive supervision of the operation of buildings thru periodic visits by an official responsible for the proper operation of school buildings; that, at best, even if principals report deficiencies freely, efficiency cannot be secured in such negative manner.

No reports of any kind are submitted to the Business Manager, to the Supervisor of Property, or to the Committee on Supplies and Janitors to assist in the supervision of the operation of buildings or to serve as an index of the character of work performed.

Because of the cross currents and special interests appearing in the janitorial and engineering service, the Committee on Supplies and Janitors, which is responsible for the economic and efficient operation of buildings, is unable to fulfil its duties properly. An attempt was made to learn how effectively this Committee controls the service, but no tangible information could be obtained. The impression was gained, however, from interviews, that comparatively little information concerning the actual operation of buildings seeps thru to the Committee.

5. SIZE OF STAFFS IN ELEMENTARY SCHOOLS

Elementary school buildings heated by steam operated by engineers who are responsible for the heating, ventilating and cleaning of the building. They are employed for the twelve months of the year, and for ten months they are allowed $5.32 per room per month which amount is paid

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to a janitor who is directly concerned with the cleaning of the building. The payroll for the largest elementary school of such type, twenty-four rooms, for operation is $2,805.36, $127.38 per month for twelve months, for the engineer, and $127.68 per month per month for ten months, received by the janitor. Undoubtedly more than one person is required for the entire operation of the larger elementary school buildings, but it is a question whether more than one person is required to operate the heating plant and to clean buildings of six, eight, ten and twelve rooms.

The engineers employed by the Board of Education, especially in the smaller schools, have very little to do and have considerable leisure time at their disposal. The question resolves itself, therefore, into evolving a plan by which a full day's work may be obtained from the engineers. It is realized that the rules forbid an engineer to leave the boiler room, but it is believed that by a practical application of this rule, enough of the engineers' spare time can be utilized daily in the smaller schools to clean the entire building.

Such plan appears more feasible when it is considered that one man cleans and keeps furnace heated schools consisting of as many as thirteen rooms, where nine furnaces and four stack heaters must be kept going.

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6. SIZE OF SHIFTS IN ELEMENTARY SCHOOLS ON A HIGH SCHOOL BASIS

When an elementary school building attains a cer-

tain size, decided arbitrarily by the Committee on Supplies and Janitors, it is placed upon a "high school" basis for purposes of operation only. There are nine elementary schools classed as high schools, ranging in size from twenty rooms to thirty-four rooms to a school. The Garfield School with thirty-four rooms is an exceptional case and will be dealt with separately.

There is no definite standard for deciding when an elementary school should be classed as a high school. The smallest of these, excepting the Marr School, has twenty-four rooms, but on the other hand, there are a number of elementary schools not on a "high school" basis which also have twenty-four rooms. The Chairman of the Committee on Supplies and Janitors could give no standard of measurement beyond the arbitrary decision of the Committee.

By placing an elementary school on a high school basis is meant that three persons are automatically added to the building operating staff - the engineer receiving a fireman and the janitor an assistant janitor and cleaner, the latter usually a woman. In addition to this, the janitor and his assistant are employed for the twelve months of the year, whereas the janitor in an elementary school is hired for only ten months. A comparison of two schools one on a high school basis and one on an elementary basis with but one room difference between them, will serve to show what it means in dollars and cents:

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Franklin School

25 Rooms - High School Basis

					Cost per room per year
1 Engineer	12 mos.	$128.83	$1,545.96	Engineering	$100.17
1 Fireman	"	79.86	958.32		
1 Janitor	"	99.82	1,197.84		
1 Assistant Janitor	"	79.86	958.32	Janitorial	107.54
1 Cleaner	10 "	53.24	532.40		
	Total		$5,192.84		$207.71

ELLIS SCHOOL

Elementary Basis — 24 Rooms

			Cost per Room per year
1 Engineer	- 12 mos $127.38	$1,528.56	$63.69
1 Janitor	- 10 " 127.68	1,276.80	53.24
	Total	$2,805.36	$116.93

Difference in Cost of Engineering Service per room per year	$36.48
Difference in Cost of Janitorial Service per room per year	54.30
Difference in Cost of total Service per room per year	90.78
Difference in cost of total service for whole school	$2,387.48
Difference in size of schools in rooms	1 Room

The above comparison shows that altho the Franklin School has but one room more than the Ellis School, there is spent upon the former, for operating services, $5,192.84 per year, while upon the latter there is spent $2,805.36, a difference of $2,387.48. In other words, that one additional

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ELLIS SCHOOL

Elementary Basis			24 Rooms Cost per Roo per year
1 Engineer - 12 mos	$127.38	$1,528.56	$63.69
1 Janitor - 10 "	127.38	1,276.80	53.24
Total		$2,805.36	$116.93

Difference in Cost of Engineering Service per room per year	$36.48
Difference in Cost of Janitorial Service per room per year	54.30
Difference in Cost of Total Service per room per year	90.78
Difference in Cost of Total Service [illegible]	[illegible]
Difference in Size of Schools in Rooms	1 Room

The above comparison shows that [illegible] the Franklin School has but one room [illegible] the Ellis School, there is spent upon the former, [illegible] services, $5,192.84 per year, while upon the latter there is spent $2,805.36, difference of $2,387.48. In other words, that one additio

room apparently costs $2,387.48 in salaries alone, for operation. The fact that the Franklin School is used as a summer school does not modify the value of this camparison, because the nine rooms occupied during the summer can easily be cleaned by the engineer who has nothing to do during the summer, and who is retained in any event, whether the school is on a "high" or "elementary" basis.

Following is a table showing the difference in the cost of operation per room in elementary schools and in schools on a high school basis. Schools of approximately the same size are compared. In every instance, it will be noted, excessive increase in the cost of operation in the schools on a high school basis.

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TABLE SHOWING COMPARISON OF COSTS OF OPERATION
IN ELEMENTARY SCHOOLS AND SCHOOLS ON A "HIGH SCHOOL" BASIS.

			Engineering		Janitorial			
	School	No. Rooms	Total Cost	Cost Per Room	Total Cost	Cost Per Room	Total Cost Per Room	Total for Whole Schoo
	Columbian	24	$1528.56	$63.69	$1276.80	$53.24	$116.93	$2805.36
	Ellis	24	1528.56	63.69	1276.80	53.24	116.93	2805.36
	Webster	22 4/5	1507.20	66.11	1213.90	53.24	119.35	2721.10
	Stephens	22 3/5	1503.84	66.54	1203.20	53.24	119.78	2707.04
	Hely	22	1503.84	66.54	1203.20	53.24	119.78	2707.04
	Thirkell	22	1493.26	67.87	1171.20	53.24	121.11	2664.46
	Higgins	22	1493.26	67.87	1171.20	53.24	121.11	2664.46
	Condon	22	1493.26	67.87	1171.20	53.24	121.11	2664.46
(1)	Lillibridge*	24	1493.26	67.87	2688.56	112.02	179.89	4181.82
	Fairbanks*	26	2574.48	99.02	2688.56	103.41	202.43	5263.04
	Franklin*	25	2504.28	100.17	2688.56	107.54	207.71	5192.84
	Moore*	25	2504.28	100.17	2688.56	107.54	207.71	5192.84
	Bishop*	29	3673.56	126.67	4179.28	144.12	207.79	7852.84
	Russell*	25	3673.56	146.94	4179.28	167.17	314.11	7852.84
(2)	Marr*	20			2322.64	116.13		
	Joyce*	26	1563.48	60.13	2688.56	103.41	163.54	4252.04

*Schools on High School Basis

1 Estimates include an assistant engineer, but not yet hired.

2 Heated by a central heating plant together with Northwestern High and Martindale Norval School

IN DIFFERENT SCHOOLS AND SCHOOLS OF A "HIGH SCHOOL" BASIS.

NUMBER AND COST OF MODERN LANGUAGE COURSES IN SECONDARY

School	Boys	No. of Pupils	Cost per Pupil	Cost of Instr.	Cost per Room	Cost of Instr.	Cost per Room	Cost of Equip.	Cost per Pupil
Boston									
Brookline									
Cambridge									
Chelsea									
Everett									
Fall River									
Fitchburg									
Gloucester									
Haverhill									
Holyoke									
Lawrence									
Lowell									
Lynn									
Malden									
Medford									
Melrose									
Natick									
Newburyport									
Newton									
North Adams									
Northampton									
Peabody									
Pittsfield									
Quincy									
Salem									
Somerville									
Springfield									
Taunton									
Waltham									
Watertown									
Woburn									
Worcester									

(1) Equipment

Textbooks

Reference books

Blackboards

Maps

Charts

Stereoscopes

Stereographs

Phonographs

Records

Pictures

Other equipment

(2) Rent

Heat

Janitor service

Light

Water

Other expenses

Total

Average cost per pupil for instruction

Average cost per pupil for equipment

Average cost per pupil for rent, heat, janitor service, light, water, and other expenses

Average total cost per pupil

Number of pupils per teacher

Number of pupils per room

Number of pupils per blackboard

Number of pupils per map

Number of pupils per chart

Number of pupils per stereoscope

Number of pupils per stereograph

Number of pupils per phonograph

Number of pupils per record

Number of pupils per picture

Number of pupils per other piece of equipment

The following table shows how much it would cost to operate the "high school basis" schools, if they were placed on the same schedule as the steam heated elementary schools:

Table showing difference between salaries paid in schools on a "high school" basis and salaries that would be paid in the same schools if on an "elementary school" basis.

School	No. Rooms	Engineers' Salary On H.S. Basis	Engineers' Salary On E.S. Basis*	Janitors' Salary On H.S. Basis	Janitors' Salary On E.S. Basis#	Total Salaries On H.S. Basis	Total Salaries On E.S. Basis	Difference
Lillibridge	24	$1493.26	$1493.26	$2688.56	$1277.76	$4181.82	$2771.02	$1410.80
Fairbanks	26	2574.18	1562.64	2688.56	1384.24	5263.04	2946.88	2316.16
Marr	20			2262.64	766.66	2262.64	766.66	1921.90
Franklin	25	2504.28	1545.12	2688.56	1331.00	5192.84	2876.12	2316.72
Moore	25	2504.28	1545.12	2688.56	1331.00	5192.84	2876.12	2316.72
Joyce	26	1563.48	1562.64	2688.56	1384.24	4252.04	2946.88	1305.16
Bishop	29	3673.56	1615.20	4179.28	1543.96	7852.84	3159.16	4693.68
Russell	25	3673.56	1545.12	4179.28	1331.00	7852.84	2876.12	4976.72

* Engineering elementary schools (E.S.) Minimum monthly salary $102.48. Rooms above 6 add $1.46 per room per month.

\# Janitor elementary schools (E.S.) $53.24 per room per year ($5.32 a room per month - 10 months)

per month - 10 months)

Quantos alqueires equivale (12'2') $22'87 per room per desk (25'25 x room

Read 2 by $2'80 per room per month"

Surprise the accountant (5'2') Minimum monthly extra $10'28' Rooms

Taste showed filmsetting occasion

a school in school on a floor
earlier per desk" goats sung artistic
pile could help in the game
pile could help in the game
pile could help in the game

Without discussing the question of proper standards of payment for janitorial and engineering service, it seems perfectly obvious and absolutely fair to state that the salary cost of operating the buildings on a "high school" basis represents a great overpayment for the service rendered when compared to the salary cost of operating elementary school buildings. Certainly, it will not be denied that the addition of $2,387.48 per year to the salary cost of operating the Franklin School, because it contains one room more than the Ellis School is unwarranted; that while the addition of one room increases the work of operating it somewhat, such added work does not justify an 85% automatic increase in the salary roll. In comparing a twenty-two and a twenty-four room elementary school with a twenty-four and a twenty-nine room "high school basis" building respectively in Table 1, it is found that the operating salaries have been increased 56% in the one instance and 180% in the other, while the number of rooms have increased 9% and 20% respectively.

Neither should the addition of a number of rooms mean that it is necessary to employ a fireman, a janitor and an assistant janitor for the twelve months of the year in addition to the engineer, when with a few rooms less it is deemed apparently sufficient to employ one engineer for the full year taking the janitor off the payroll for the two summer months. In fact there are now sixty-seven

elementary schools in which the janitor is employed for only ten months of the year, and the buildings do not seem to suffer.

In short, the classifying of an elementary school as a high school results in an automatic increase in the salary cost of operating the building out of proportion to the size of the building and without reference to the actual amount of added help necessary to care for the school properly.

GARFIELD SCHOOL

This School presents a problem which merite individual attention.

The Garfield School comprises two separate buildings, both elementary schools without any special features in the construction of the buildings. One contains eighteen rooms, the other 16 rooms. The engineering and janitorial staff of these two buildings is made up as follows:

Garfield School

1 Chief Engineer	$141.99	per mo.	12 mos.	$1703.88	Per year
1 Assistant Engineer	115.65	" "	12 "	1387.80	"
1 Fireman	79.86	" "	12 "	958.32	"
1 Chief Janitor	99.82	" "	12 "	1197.84	"
2 Assistant Janitors	79.86	" "each	12 "	1916.64	"
2 Cleaners	53.24	" "each	10 "	1064.80	"
		TOTAL COST		$8229.28	Per year.

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1 Chief Janitor	99.82	" "	12 "	1197.84	"
2 Assistant Janitors	79.8[illegible]	" Each	12 "	[illegible].64	"
2 Cleaners	53.24	" Each	10 "	1064.20	"
		TOTAL COST		$8229.20	Per year

Below is given the cost of operating two buildings containing the same number of rooms as the Garfiled structures, and practically the same type buildings;

Beard School - 18 Rooms

1 Engineer	$118.59 per mo.	12 mos.	$1423.08
1 Janitor	95.76 " "	10 "	957.60
		TOTAL COST	$2380.68

Bellevue School - 16 Rooms

1 Engineer	115.65 per mo.	12 mos.	$1387.80
1 Janitor	85.12 " "	10 "	851.20
		TOTAL COST	$2339.00

Total cost two schools -34 rooms	$4619.68
Total cost Garfield School	8229.28
Increased cost of Garfield School	$3609.60

These figures speak for themselves. In the case of the Garfield School, it costs 78% more in salaries to operate the two buildings, than it does to operate the Beard and Bellevue Schools.

If no advantage can be taken of the proximity of the two buildings of the Garfield School, at least they could be operated on the same basis as any other two buildings of an equal number of rooms. It is believed, however, that because of the proximity of the two buildings, one engineer and a fireman could operate effectively the heating plants of both buildings.

Marr School

Altho having but twenty rooms, the Marr School was put on a "high school" basis, probably because it receives its heat and power from the same plant which supplies the Northwestern High School. Apparently, to comply with

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Altho having but twenty rooms, the Mars School was put on a "high school" basis, probably because it receives its heat and power from the same plant which supplies the Northwestern High School. Apparently, to comply with

its rank as an elementary school on a "high school" basis, the Marr School employes a chief janitor and two women cleaners. Compared to any of the elementary schools of the same or greater size, the two cleaners are superfluous employes. The same is true of the Martindale Normal Training School, altho it is slightly larger than the Marr School.

SIZE OF STAFFS IN HIGH SCHOOLS

Without making a more intensive and continuous study of the duties of janitors and engineers in high schools and of the time required to perform such duties, it is impossible to state incontrovertibly just how large a staff is required, but even a general study of the situation indicates that the engineering and janitorial staffs of the high schools are larger than they need be for the duties to be performed. This conclusion was reached by comparing one school with another and by comparing the staffs in the high schools with the staffs in office buildings and industrial plants of the city.

a. Engineering Service

A comparison of the high schools with each other brings out the fact that there is lacking: first, a standard for determining the number of engineers and firemen required to operate the heating and ventilating plant of a building; secondly, a standard for organizing the engineering staffs.

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SIZE OF STAFFS IN HIGH SCHOOLS

Without making a more intensive and complete study of the duties of janitors and engineers in high school and of the time required to perform each duties, it is impossible to state incontrovertibly that too large a staff is required, but even a general study of the situation indicates that the engineering and janitorial staffs of the high schools are larger than they need be for the duties to be performed. This conclusion was reached by comparing one school with another and by comparing the staffs in the high schools with the staffs in office buildings and industrial plants of the city.

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Table comparing size of staffs in High Schools with heat load in sq. ft. of radiation and amount of coal handled.

High School	#*Total Sq. ft. in equivalent of 2 Col. C.I. Radiation	*Equivalent in Boiler Horse Power	Tons Coal Received 1915-16	Total No. on Staff	No. of Coal Passers
Northeastern	33,200	375		7	4
Cass	41,946	650	1769	6	3
Western	42,946	325	1015	5	2
Eastern	50,557	285	992	7	4
Northwestern Plant	82,870	600	2671	7	4
Central	98,016	900	2959	9	6
Northern				6	3
Southeastern				6	3

* Data obtained from report by Messrs. Ammerman & McColl, Consulting Engineers, for the Board of Education.

Include "heat required for ventilation" and "heat loss through building walls" in equivalent" of 2 Col. C.I. radiation.

It is significant to note in the above table that the Northwestern Plant which must maintain a heat load equivalent to 82,870 sq. ft. of 2 column cast iron radiation, employs seven men, a number apparently sufficient to perform the work required. On the other hand, the Northeastern High School, which has a heat load equivalent only to 33,200 sq. ft. of radiation, and the Eastern High School with a heat load equivalent to 50,557 sq. ft. of radiation also employ engineering staffs of seven men each to maintain these much smaller heat loads. The Cass and Western employ one and two men less, respectively, on their engineering staffs

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High School	Radiation	*Total Sq. ft. in equivalent of 2 Col. C.I. Horse Power	*Equivalent Boiler	Tons Coal received 1915-16	No. on Staff	Total No. of Coal Passers
Northeastern	33,200	376			7	4
Cass	41,946	650		1769	6	3
Western	44,946	725		1015	5	2
Eastern	50,557	285		992	7	4
Northwestern Plant	82,870	600		2671	7	4
Central	98,016	900		2959	9	6
Northern					6	5
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than does the North Eastern, although the heat loads to be maintained in each of the former two schools is greater than that of the latter. Nor must the fact be overlooked that the Cass has one more coal passer than the Western, although the heat load in the latter is slightly larger than that in the Cass.

In whatever way the above table is analyzed, whether the Western or the Northwestern school is taken as a basis for comparison, the conclusion that the staffs employed are too large, becomes self-evident. And by this statement it is not meant to imply that the North Western heating plant is running on the minimum number of men necessary for effective work.

The question of economy of fuel and number of tons handled per coal passer is left to be taken up by the chief engineer of the Board of Education through tests and investigation of coal handling facilities. The latter vary with the schools. In the above table the problem is merely indicated.

Table Showing Organization of Staff with Respect to Hours on Duty.

	Chief Engineer	Assistant Engineer	Coal Passers No.
Eastern	6 A.M. - 3 or 4 P. M.	6 A.M. - 3 or 4 P. M. 6 P.M. - 6 A.M.	2 6 A.M. - 2 P.M. 1 2 P.M.- 10 P.M. 1 10 P.M.- 6 A.M.
Central	6 A.M. - 3 or 4 P.M.	5 A.M. - 1 P.M. 2 P.M.- 10 P.M.	2 6 A.M. - 2 P.M. 2 2 P.M.- 10 P.M. 2 10 P.M.- 6 A.M.
North eastern	6:30 A.M. - 4 P.M.	6 A.M.- 2 P.M. 2 P.M.- 10 P.M.	1 7 A.M. - 3 P.M. 1 3 P.M.- 11 P.M. 1 11 P.M.- 7 A.M.
North western	Winter (5 mo) " "	6 A.M. - 6 P.M. 6 P.M. - 6 A.M.	1 6 A.M.- 4 P.M. 2 10 A.M.- 8 P.M.
	Summer (7 mo)	6 A.M. - 2 P.M. 2 P.M.- 10 P.M.	1 8 P.M.- 6 A.M.
Cass	6 A.M. - 3 or 4 P.M.	6 A.M. - 4 P.M. 6 P.M. - 6 A.M.	1 Morning watch 1 Afternoon " 1 Night "
Western	6 A.M. - 3 or 4 P.M.	6 A.M.- 3 or 4 P.M 6 P.M.- 6 A.M.	

Northern and Southeastern not organized at this time

Northern Ry. Continuous Vest Coast Express

Victoria	9 A.M.	2 or 4 P.M.	9 P.M.
			11 P.M.
Cobb	2 A.M.	2 or 4 P.M.	9 A.M.
			4 P.M.

			Lv Wright
			" Matheson
			" Mountain Station
	Summit (1 hr)	5 P.M.	8 P.M.
Westbury	"	5 P.M.	8 P.M.
Moira	Minnet (2 hrs)	6 P.M.	9 P.M.
		6 P.M.	9 P.M.

			Lv Ft. Smith
			" Ft. Fitz
			" Ft. Resolution
Coolidge		12 P.M.	7 P.M.
Moira	6:30 P.M.	6 P.M.	9 A.M.
		6 P.M.	9 A.M.

			Lv Ft. Resolution
			" Ft. Fitz
			" Ft. Smith
Centent	6 A.M.	2 P.M.	7 P.M.
			10 P.M.
			10 P.M.
Eastern	6 A.M.	2 or 4 P.M.	9 A.M.
			5 P.M.

Eastern Standard Time

Mountain Standard Time

Pacific Standard Time

No. 1 Local Passenger

No. 2 Local Passenger

No. 3 Local Passenger

No. 4 Local Passenger

No. 5 Local Passenger

No. 6 Local Passenger

No. 7 Local Passenger

No. 8 Local Passenger

No. 9 Local Passenger

No. 10 Local Passenger

No.

All of the high schools have a chief engineer who is on duty during the day watch;i.e. from 6 A.M. to 3 or 4 P.M. The difference in the organization of the work lies in the assignments of the assistant engineers and the firemen.

In the Central High School, one assistant engineer works from 5 A.M. to 1 P.M., the other from 2 to 10 P.M. In the Eastern High School, one assistant engineer works from 6 A.M. to 3 or 4 P.M., and the other from 6 P.M. to 6 A.M. In the Western, the two assistant engineers work together twenty-two hours a day, ten hours for the one on the day shift and twelve hours for the one on the night shift, the men rotating every two weeks from one shift to the other. In the Cass High School and in the Northwestern conditions seem to be the same as in the Western and the Eastern.

The Central High School employs for the night watch. from ten P.M. to 6 A.M. two coal passers, while the Northeastern one coal passer, the other high schools seem to need an engineer and a coal passer on duty on this shift.

The Eastern High School uses two coal passers plus the assistant engineer on the day shift from 6 A.M. to 2 P.M. the same number of men as seem to be required by the Central High School in a much larger plant, and one more man than is required by the other High schools.

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of the men after they are employed indicates that the attention which this problem merits has not been given it, and that some basis other than efficiency or economy in the service has been the basis for employing engineering staffs.

When compared to a number of office buildings in Detroit, the conclusion that the staffs in the various high schools are too large becomes more obvious. For instance, an office block which has a plant of four boilers of 350 H.P. each consuming 10,000 tons of coal a year, heating a building area of 450,000 square feet - an area almost twice as large as that of the Central High School - is operated by a staff consisting of one chief engineer, three assistant engineers, three firemen, and two ash men. In other words, there is one engineer and one fireman who are directly concerned with the operation of the boilers during each watch; and it must be remembered that this plant is in active operation twenty-four hours of the day. This office block also contains fifteen elevators, which are operated by the power generated in this building. An idea of the extent of the work may be gained from the fact that 105,000 Kw. hours of current are generated by it in a month.

Another office building of fifteen stories, which has a boiler plant of 700 H.P. capacity and consumes from fourteen to fifteen tons of coal every day in the year, operates its plant with three engineers and three firemen- one engineer and one fireman on duty at each shift.

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Another office building of fifteen stories, which has a boiler plant of 700 H.P. capacity and consumes from fourteen to fifteen tons of coal every day in the year, operates its plant with three engineers and three firemen - one engineer and one fireman on duty at each shift.

One factory in Detroit which has a power plant of 2100 H.P. capacity, operated day and night, and consumes 60 tons of coal every day in the year, operates its plant with thirteen men distrubted over twenty-four hours of the day.

In the light of such conditions, it seems inevitable to conclude that the staffs in the high schools are too large; or at least, that the matter deserves intensive study for the purpose of determining definitely how many engineers and firemen are actually needed to operate each high school.

It will be conceded that it is proper to demand or to expect as nearly continuous work as possible during the time an engineer or fireman is on duty. Judging by the amount of work being done every day in commercial buildings by engineers and firemen, there is no reason to believe that the heating and ventilating of a school building present an unusual task. Upon this basis, therefore, it is believed that the maximum staff required to operate a school building, even during these months when evening school is in session, is five men,- two engineers and three firemen. A staff of this size would not result in less effective operation of the plant, but would merely result in causing the men on duty probably to work more comtinusously. One of the engineers would be designated as the chief engineer responsible for the power plant, thus eliminating the superfluous engineer who sets as chief under the present organization. There is no reason what-

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soever for the employment of a chief engineer and an assistant engineer on the same shift. With the modern devices for handling coal, it should not be over-difficult for one fireman on each shift to handle all the coal that is consumed in a high school plant, because experience shows that one fireman with no better means handles more coal in commercial buildings. The three firemen would be assigned to the three shifts covering twenty-four hours, thus leaving one on watch during the night,- a plan which seems to work satisfactorily even now in the Central High School. During the months of the year when night schools are not in session it seems that one engineer on the job is sufficient, and three firemen would cohstitute an adequate staff for the work to be performed, at least during the three months in the year when evening school is not in session and the two and a half months when no classes are in session. This, of course, excludes the Cass Technical High School.

Under present arrangements chief engineers in the high schools are being paid $2.00 for every night that the evening schools are in session, which means that two payments are being made for one job, because the regular hours of duty of the engineering staff include the evening hours. This extra payment implies extra work upon the part of the chief engineer, which if performed by him would eliminate the necessity of employing any assistant engineers, because during the few hours between the close of the day sessions and the opening of the evening sessions,

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engineers, because during the few hours between the close
of the day sessions and the opening of the evening sessions,

and during the night, a man with a second class license could be left in charge.

Since, for the good of the service, a twelve hour day should be discountenanced, it remains to employ an assistant engineer for the second watch when the evening schools are in session and to disallow the extra payment of $2,00 to chief engineers in high schools.

b. Janitorial Service

It is impossible to state precisely, without a more detailed study of the work, the number of janitors and cleaners needed to care for a high school; but from a general study of the situation, comparing the high schools with each other and with commercial buildings, it can be said that the cost of janitorial service in the high schools is higher than it should be. This is due partly to the number and kinds of persons employed, and partly to the salary paid them. As the latter question will be discussed in a subsequent section of the report, the proposition of the size of the staffs will be discussed here.

High School	Area		Janitorial Staff	Annual Payroll for Janitors
	Building	Walks		
*Southeastern	103,996 sq.ft	38,854 sq.ft.	12	$9,183.84
Eastern	110,834 " "	18,051 " "	11	8,651.44
Northwestern	116,128 " "	50,542 " "	11	8,651.44
Cass	124,066 " "	23,294 " "	9	7,158.72
Western	126,978 " "	7,954 " "	9	7,586.64
*Northern	137,329 " "	27,277 " "	12	9,183.84
Northeastern	139,276 " "	13,397 " "	12	9,183.84
Central	255,687 " "	33,356 " "	15	10,502.96

* Contemplated staff- schools not yet opened.

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Taking it for granted that the work in all of the high schools is in the main the same, for the purposes of this report, the areas of the buildings may be taken as a basis of comparison. In so doing, it is found that the Southeastern High School with a building area of 103,966 square feet and the Northern High School, with an area of 137,329 square feet, each, have a janitorial staff consisting of twelve janitors and cleaners, - one chief janitor, five assistant janitors, and six cleaners (female). Between the areas of the Southeastern High School and the other two, there is a difference of 33,000 and 35,000 square feet respectively a difference which equals the size of such school buildings as the Martindale Normal and the Harr Schools,- for each of which schools it seems necessary to employ a janitor and two cleaners. And yet, with this great difference in area between the Southeastern and the other two high schools, the former has as large a staff as the other two schools in question. Further, the Eastern High School, with an area of 110,834 sq. ft., and the Northwestern High School with an area of 116,128 sq. ft., have a staff of eleven, while the Western High School, with an area of 126, 978 sq. ft., and the Cass, with an area of 124,066 sq. ft., the latter the busiest and the most used high school in the city, have each a janitorial staff of nine persons. The Central High School has a staff of fifteen persons,- one chief janitor, six assetant janitors, and eight cleaners.

Taking it for granted that the work in all of the high schools is in the main the same, for the purposes of this report, the areas of the buildings may be taken as a basis of comparison. In so doing, it is found that the Southeastern High School with a building area of 105,966 square feet and the Northern High School, with an area of 137,329 square feet, each, have a janitorial staff consisting of twelve janitors and cleaners, - one chief janitor, five assistant janitors, and six cleaners (female). Between the areas of the Southeastern High School and the other two, there is a difference of 33,000 and 35,000 square feet respectively a difference which equals the size of each school buildings as the Martindale Normal and the Kerr schools, - for each of which schools it seems necessary to employ a janitor and two cleaners. And yet, with this great difference in area between the Southeastern and the other two high schools, the former has as large a staff as the other two schools in question. Further, the Western High School, with an area of 110,834 sq. ft., and the Northwestern High School with an area of 116,128 sq. ft., have a staff of eleven, while the Western High School, with an area of 125,978 sq. ft., and the Cass, with an area of 124,058 sq. ft., the latter the busiest and the most used high school in the city, have each a janitorial staff of nine persons. The Central High School has a staff of fifteen persons, - one chief janitor, six assistant janitors, and eight cleaners.

In considering these areas, the sidewalks and the inner walks were not taken into consideration, because the character of the cleaning required is different from that required in the building, and does not present an important factor in the additional help required. The greatest area of walk space is found in the Northwestern High School, which is 50,542 square feet, and according to authoritative reports, a "white wing" can keep clean in a work day, which means going over it again and again, up to 225,000 sq.ft. in a city like Washington, D.C., and up to 99,000 sq.ft. in a city like St. Louis, depending upon the character of the street. Therefore, the sweeping of well paved concrete walks, such as is found around the schools, should not complicate very materially the problem of janitorial service.

Following are the rules for cleaning which govern the work of janitors in the schools:

> All rooms, platforms, halls, stairs, water closets, steps and walks in yards shall be thoroughly swept each day after the afternoon session of school; and the sidewalks must be kept free from snow and ice. (100)
>
> All walls, cornices and ceilings are all to be dusted at least once in two weeks; and all furniture, such as desks, tables, pianos, etc. shall be dusted every day after rooms have been swept, or in time for the next day's session. (101 a)
>
> Permitted to sweep halls, corridors and stairways after the afternoon recess, and teachers shall be requested to give janitors an opportunity to sweep rooms at 3.50 P.M. or as soon thereafter as the janitor may be ready to commence work, all work to be done subject to the discretion of the Principal. (101 b)

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> Hall, floors and stairs shall be scrubbed at least once a week, and floor or rooms whenever directed by Principal. All windows and woodwork and basements shall be kept clean. Floor of boys' water closets shall be scrubbed every day. Inkwells shall be cleaned and supplied with ink as directed by Prihcipal. Erasers and chalk boxes shall also be kept clean. (102)

In order to obtain an idea of how the janitorial staffs are organized and during what hours of the day they work, a questionaire was sent to all the janitors, to which very imperfect answers were received. However, the information gathered was sufficient to indicate:

> That there is, apparently, very little difference between the women's work and the men's work, although the difference in pay is over $26 a month in each case.
>
> That a reorganization of the staffs on the basis of giving each person employed sufficient work for eight hours would reduce the number of employees without impairing the efficiency of the work.
>
> That a study of the amount of janitorial work, possible to be accomplished by one person in eight hours, will probably result in a reduction of the staff or an increase in performance.

The following schedules from the Cass and Western High Schools, will serve to explain the above statement:

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The following schedules from the Cass and Western High Schools, will serve to explain the above statement:

Western High School

		A.M.	P.M.
Chief Janitor	91/2	7:30-12:00 Unlock doors, dust stairway and corridors, sweep corridors, Supervision.	1:00-6:00 Supervision-Watchman
Smith	8	7:30-11:00 Dusts stair rails, lockers, and rooms. Sweeps sidewalks and corridor. Hall duty	12:00-4:30 Hall duty. Sweeps 6 rooms and washes blackboards.
Schewalker	8	7:30-11:00 Dust stair rails, wainscoting, typewriter room, auditorium and sweeps corridor and sidewalks. Hall duty	12:00-4:30 Hall duty. Sweeps 6 rooms and washes blackboards.
Seidler	8	7:30-12:00 Dust stairways, mechanical drawing rooms, and rooms. Sweeps basement. Hall duty.	1:00-4:30 (Sweeps 6 rooms (and washes blackboards.
Walton	8	7:30-12:00 Dusts stair ways, rooms. Hall duty. Sweeps sidewalk.	1:00-4:30 Sweeping rooms and washes blackboards.
Levy	8	7:30-11:00 Sweeps gym. empties paper boxes. Dusts. Hall duty.	12:00-4:30 Sweeps 4 rms and washes blackboards. Charge of shower room.
Mrs. Muller*	7 1/2	8:00-12:00 Dusts Rooms, Sweeps corridors and stairs. Charge of girl's basement.	1:00-4:30 Sweeps 7 rooms and washes blackboards
Mrs. Conkle	7	8:30-12:00 Dusts rooms. Sweeps corridor and stairs. On duty in girl's basement.	1:00-4:30 Sweeps office anti-rooms etc.
Mrs. Smith	7	8:30-12:00 (Same as Mrs. Conkle)	1:00-4:30 Sweeps 7 rooms and washes blackboards.

* Women alternate weekly on 7 1/2 hour day.

Western High School

		A.M.	P.M.
Chief Janitor	91/2	7:30-12:00 Unlock doors, dust stairway and corridors, sweep corridors, Supervision.	1:00-6:00 Supervision-Watchman
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Walton	8	7:30-12:00 Dusts stair ways, rooms. Hall duty. Sweeps sidewalk.	1:00-4:30 Sweeping rooms and washes blackboards.
Levy	8	7:30-11:00 Sweeps gym. empties paper boxes. Dusts. Hall duty.	12:00-4:30 Sweeps 4 rms and washes blackboards. Charge of shower room.
Mrs. Muller*	7 1/2	8:00-12:00 Dusts Rooms, Sweeps corridors and stairs. Charge of girl's basement.	1:00-4:30 Sweeps 7 rooms and washes blackboards
Mrs. Conkle	7	8:30-12:00 Dusts rooms Sweeps corridor and stairs. On duty in girl's basement.	1:00-4:30 Sweeps [illegible] anti-rooms etc.
Mrs. Smith	7	8:30-12:00 (Same as Mrs. Conkle)	1:00-4:30 Sweeps 7 rooms and washes blackboards.

* Women alternate weekly on 7 1/2 hour day.

Central High School

	Morning	Afternoon
J.D. Kopp- Chief Janitor Takes care of bells, repairs, supervises.		
Assistant Janitors		
Wm. Gunz - 6:30-3:00	Sweeps walk, cleans two shops used during night school, gathers up all waste paper on two floors and bales it, cleans wash bowls in shops and toilet room, sweeps gym.	(Works with Goldsmith until 2:30) 1:30 sweeps halls on two floors, two stairways and four entrances.
Goldsmith 6:30-4:00	Takes care of northwest end of building entrances, walks- cleans two shops (machine and wood turning, left over from afternoon) empties waste paper boxes	1:30 starts to sweep (Works with Gunz) 2:30-4:30 runs an elevator.
Leatzan 6:30-3:00	Unlocks building, helps sweep big grade room; odd jobs washing electric lights, etc.	1:30 starts to sweep corridors and 4 wide stairs (with Drouskowski)
Drouskowski 6:30-3:00	Helps sweep grade rooms, sweeps main entrance, 8:00-12:45 runs an elevator	1:30 sweeps (helps Leatzan)
Peppan 6:30-3:30	Dusts lavatories 8:00-2:30 runs an elevator.	2:30-3:30 sweeps lavatories
Vick 10:00- 6:00	Takes care of and watches boys locker room, gymnasium and swimming pool	Takes care of and watches boys locker room, gym. and swimming pool.

Central High School

	Morning	Afternoon
J.D. Kopp- Chief Janitor Takes care of bells, repairs, supervises.		
Assistant Janitors		
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Goldsmith 6:30-4:00	Takes care of northwest end of building entrances, walks- cleans two shops (machine and wood turning, left over from afternoon) empties waste paper boxes	1:30 starts to sweep (Works with Gunz) 2:30-4:30 runs an elevator.
Leatzan 6:30-3:00	Unlocks building, helps sweep big grade room; odd jobs washing electric lights, etc.	1:30 starts to sweep 4 corridors and 4 wide stairs (with Drouskowski)
Drouskowski 6:30-3:00	Helps sweep grade rooms, sweeps main entrance, 8:00-12:45 runs an elevator	1:30 sweeps (helps Leatzan)
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Cleaners
Hours: 9:A.M.-5:00-6:00 P.M.

	Morning	Afternoon
Stalter	Dusts corridors on first floor and basements.	1:30 Sweeps and dusts 2 grade rooms; commercial department(3 big rooms); drawing department (3 big rooms)
Bender	Dusts main corridor and four entrances	Sweeps 11 recitation rooms and one grade room
Bennett	Dusts halls and stairways, helps in domestic science	1:30 Sweeps and dusts 2 grade rooms, domestic science department (8 rooms), and 2 recitation rooms.
Collins	Dusts stairways and corridors on third floor	1:30 Sweeps and dusts all rooms on third floor (14 recitation, 1 grade room and 2 cloak rooms) Takes care of toilets, bowls, and wash stands
O'Grady	Cleans auditorium takes care of basement toilet	Sweeps and dusts 12 recitation rooms
Dunn	Dusts books in library in the morning takes care of teachers toilet room	1:30 Sweeps and dusts 3 offices, library, 4 recitation rooms, biology department(3 rooms)
Harrigan	Dusts second floor corridor and stairways	1:30 Sweeps and dusts 12 recitation rooms, 3 cloak rooms, 1 grade room, 1 botany room.

Saturday - Men work 6:30 - 11:00 One on to act as watchman 9:00 to 4:30-5:00. Women work 7:00-12:00

Sunday - One man on as watchman 6:00 - 2:00

Cleaners
Hours: 9:A.M.-5:00-6:00 P.M.

	Morning	Afternoon
Stalter	Dusts corridors on first floor and basements.	1:30 Sweeps and dusts 2 grade rooms; commercial department(3 big rooms); drawing department (3 big rooms)
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O'Grady	Cleans auditorium takes care of basement toilet	Sweeps and dusts 12 recitation rooms
Dunn	Dusts books in the library in the morning takes care of teachers toilet room	1:30 Sweeps and dusts 5 offices, library, 4 recitation rooms, biology department(3 rooms)
Herrigan	Dusts second floor corridor and stairways	1:30 Sweeps and dusts 12 recitation rooms, 3 cloak rooms, 1 botany room, 1 room.

Saturday - Men
Work 6:30 - 11:00
One on to care as
watchman 9:00 to 4:30-
5:00. Women work
7:00-12:00

Sunday - One man on as
watchman 6:00 - 2:00

Eastern High School

	Morning	Afternoon
Mr. Frede Chief Janitor 8:00-5:30 Supervisor and Repairing.		
Assistant Janitors		
McMann 7:00 - 4:30	Dusts, sweeps sidewalks, takes care of tank and showers, also the lights, sweeps two large stairs, cleans out tank twice a week.	2:30 Starts to sweep Gymnasium (track and dressing room) typewriter room, one large and two small recitation rooms.
Moran and Hunter 8:00 - 5:00	Sweep two halls, two sets of stairs, and walks. Dusts.	2:30 Starts to sweep. Two grade rooms, 2 recitation rooms, wood turning room, mechanical drawing room. Wash blackboard once a week.
Longan 8:00 - 5:00	Sweeps walks, odd jobs dusts stairs and bannisters.	12:30 Starts sweeping - Chemistry laboratory, Physical Geographic laboratory, toilet (every other week) basement floor, six flights stairs boy's vestibule, two long halls.
Zimmerman 9:00 - 5:00	Sweeps walks, dusts, washes windows in hall doors, picks up paper, etc. in school yard, takes care of washstand and toilet	Sweeps and dusts laboratory, 4 recitation rooms, lunch counter, and manual training room
Saturday afternoon 11:00 - 6:00) Men Sunday 11:30 - 6:00) alternate		
Night School 6:00 - 11:00 Rotate		

Eastern High School

	Morning	Afternoon
Mr. Frede Chief Janitor 8:00-5:30 Supervisor and Repairing.		
Assistant Janitors McMann 7:00 - 4:30	Dusts, sweeps sidewalks, takes care of tank and showers, also the lights, sweeps two large stairs, cleans out tank twice a week.	2:30 Starts to sweep Gymnasium (track and dressing room) typewriter room, one large and two small recitation rooms.
Moran and Hunter 8:00 - 5:00	Sweep two halls, two sets of stairs, and walks. Dusts.	2:30 Starts to sweep. Two grade rooms, 2 recitation rooms, wood turning room, mechanical drawing room. Wash blackboard once a week.
Longan 9:00 - 5:00	Sweeps walks, odd jobs dusts stairs and bannisters.	12:30 Starts sweeping - Chemistry laboratory, physical Geographic laboratory, toilet (every other week) basement floor, six flights stairs [illegible], [illegible] halls.
Zimmerman 9:00 - 5:00	Sweeps walks, dusts, washes windows in hall doors, picks up paper, etc. in school yard, takes care of washstand and toilet	[illegible]
Saturday afternoon 11:00 - 6:00) Men		
Sunday 11:30 - 6:00) Alternate		
Night School 6:00 - 11:00 Rotate		

Cleaners

	Morning	Afternoon
Sigsworth 11:00 - 7:00	11:00 - 2:30 Dusts halls, statues, pillars, lockers	Sweeps a grade room, library, 2 offices, 6 recitation rooms, 1/2 big-hall, 1 flight stairs.
Mannebacker 11:00 - 7:00	Sweeps grade room, penmanship room, 1/2 auditorium, 5 flights stairs 1/2 hall	Same
Brown 11:00 - 7:00	Grade room; 3 recitation rooms, commercial room, 1/2 auditorium, 3 flights stairs, 1/2 hall	Same
Kolb 9:00 - 5:00	Girls' shower, toilet, laundry and sewing room, takes care of teachers' toilets.	2:30 Sweeps 1 recitation room, botany room, domestic science, girls dry room, dining rooms.

Northeastern High School

Janitorial work is not organized due to the fact that certain rooms in the building will not be opened until February. The staff consists of a chief janitor, five assistants, and six cleaners.

Cleaners

	Morning	Afternoon
Sigsworth 11:00 - 7:00	11:00 - 2:30 Dusts halls, statues, pillars, lockers	Sweeps a grade room, library, 2 offices, 6 recitation rooms, 1/2 big hall, 1 flight stairs.
Mannebacker 11:00 - 7:00	Sweeps grade room, penmanship room, 1/2 auditorium, 5 flights stairs 1/2 hall	Same
Brown 11:00 - 7:00	Grade room, 3 recitation rooms, commercial room, 1/2 auditorium, 3 flights stairs, 1/2 hall	Same
Kolb 9:00 - 5:00	Girls' shower, toilet, laundry and sewing room, takes care of teachers' toilets.	2:30 Sweeps 1 recitation room, botany room, domestic science, girls dry room, dining rooms.

Northeastern High School

Janitorial work is not organized due to the fact that certain rooms in the building will not be opened until February. The staff consists of a chief janitor, five assistants, and six cleaners.

NORTHWESTERN HIGH SCHOOL

	Morning	Afternoon
Mr. Bates Chief Janitor 7:30 - 5:00 or 6:00	Supervises, repairs	Helps Sweep
Assistant Janitors		
Louth 6:35 - 3:30	Opens school, sweeps gym, dusts lockers and basement hall, sweeps sidewalks	Starts to sweep at 12.45(together with Driscol) basement, 3 long stairs, 3 entrance: and 3 small stairs
Driscol 10:00 - 6:00	Takes care of 3 toilet rooms, glass in doors, sweeps sidewalks.	12:45 (Sweeps with Louth until 3:30-4:30 sweeps with the gang and sweeps auditorium, dressing room, 4 small offices and washes blackboards in 3 recitation rooms.
Smith 7:45 - 4:30	Dusts and sweeps hall, lockers, sweeps sidewalks, etc	12:45, together with 3 men sweeps 22 rooms and washes blackboards every day.
Hans 7:45 - 4:30	Sweeps sidewalks dusts etc.	12:45 Helps sweep and wash blackboards in 22 rooms.
Wollweber 7:45 - 4:30	Sweeps sidewalks, dusts etc.	12:45 - with the gang that sweeps 22 rooms.

Montag	Abendessen
Mrs. Pates Chalet	
Turnen	
7:30 - 8:30 Uhr Bogenschießen, Dreiecke Helga Onegi	
Abschlussball Turnhalle	
6:30 - 8:30	Thomas Brandl, Annett Bachmann und Jörg Adams Thomas Brandl und Susanne Hildebrandt Annette Hildebrandt
Dienstag	
10:00 - 5:00	Fahrt zum Hof 3 Uhr: Ritt zum Fluss, Spiele, Tanz, Lagerfeuer, Würstchen, Stockbrot
Mittwoch	
7:00 - 4:30	Ausflug nach Hamburg, Besichtigungen
Donnerstag	
	Abreise

Cleaners
9:30 - 5:30

In the morning the duties of the several cleaners are similar. They dust, lockers, halls and entrances; sweep where necessary, wash windows in doors; take care of toilets; etc. They start to sweep and wash blackboards daily at 12:45, their schedule after that time is as follows;

Ward
7 recitation rooms, 2 grade rooms.

Barowski
7 recitation rooms, 1 drawing room, 1 grade room.

Schueller
5 recitation rooms, 1 grade room, 1 large and 1 small bookkeeping room, 1 typewriter room, and 1 toilet.

Nikraut
5 recitation rooms, 1 grade room, 1 library, 2 offices, 1 zoology room, 2 toilets.

Saturday work
7:00 - 12:30

Sunday
6:00 A.M. to 3:00 P.M. alternate

Cleaners
9:30 - 5:30

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Saturday work
7:00 - 12:30

Sunday
6:00 A.M. to 3:00 P.M. alternate

Evertt School

Furnace Heated School

The Everett School is and old building consisting of twelve rooms, three corridors, six stairways and a basement. There are five furnaces, two gas heaters, and one stove in an office on the third floor. Coal is carried up three flights of stairs to the stove.

Everett School

Mr. Neff, Janitor.

Morning;

Arrives at 4:00 A.M. on Monday; at 5:00 the rest of the week; Fires the furnace, cleans all rooms used in night school; dusts all rooms, bannisters, desks, halls etc; watch the children before school takes up. After school takes up, he carries out ashes; during recess he watches the children. Following recess he flushes the urinals, and fires up.

11:30 to 12:00 takes lunch.

Afternoon.

He again fires the furnaces, after which he watches the special room students, who remain for the noon meal. Between the time school takes up and recess he sweeps the halls, stairs, and two recitation rooms. At recess he again acts as watchman. From 3:30 to 5:30 he sweeps ten rooms. After he finishes firing it is 6:00

Night School 6:00 - 9:30

Everett School

Furnace Heated School

The Everett School is and old building consisting of twelve rooms, three corridors, six stairways and a basement. There are five furnaces, two gas heaters, and one stove in an office on the third floor. Coal is carried up three flights of stairs to the stove.

Everett School

Mr. Merf, Janitor.

Morning:

Arrives at 4:00 A.M. on Monday; at 5:00 the rest of the week: Fires the furnace, cleans all rooms used in night school; dusts all rooms, bannisters, desks, halls etc; watch the children before school takes up. After school takes up, he carries out ashes; during recess he watches the children. Following recess he flushes the urinals, and fires up.

11:30 to 12:00 takes lunch.

Afternoon.

He again fires the furnaces, after which he sweeps the special room students, who remain for the noon meal. Between the time school takes up and recess he sweeps the halls, stairs, and two restaurant rooms. At recess he again acts as watchman. From 3:30 to 5:30 he sweeps ten rooms. After he finishes firing, it is 6:00

Night School 6:00 - 9:30

Questionnaire Sent Janitors

School - Cass Technical High School

Janitor - John Nort

1. Give the frequency and the time of sweeping and scrubbing the following:

	SWEEPING		SCRUBBING	
	Frequency	Time	Frequency	Time
Halls 9	Daily, nightly	10:00 P.M. 6:00 A.M.	Once a week	
Rooms	Daily, nightly	10:00 P.M. 6:00 A.M.	Once a week	
Basement	Daily	2:00 P.M.	Daily	2:00 P.M.
Toilets-8	Daily	2:00 P.M.	Daily	2:00 P.M.
Sidewalks-3	Daily	9:00 P.M.	Daily	Morning

Under frequency state whether daily, weekly or monthly
Under time give the time of day when the above work is done.

2. How often are windows washed? Five to six times a year.

3. What repair work does the janitor do? Fix seats and doors.

4. Name, position, duties and hours of each employee:

Name	Hours	Duties
John Nort	8	Chief Janitor
Fred Mees	8	Assistant chief janitor- five rooms, four toilets, two halls
Ray King	8	7 rooms; 2 halls, 4 toilets
Frank Matusinski	8	7 rooms; 1 hall; 2 stairs
August Boike	8	6 rooms, 1 hall, 2 stairs
Eva Liske	8	6 rooms; dust all halls; stairs
Anna Meach	8	6 rooms, dust all halls, stairs
Belle Heuft	8	8 rooms, two halls, 2 stairs
Pauline White	8	9 rooms, 2 halls, 2 stairs
Alfred Heuft	8	8 rooms, 2 halls, 1 stair
Wm. Quirk (Cass Annex)	8	16 rooms, 2 stairs, 2 furnaces

Questionnaire Sent Janitors

School - Cass Technical High School

Janitor - John Mott

1. Give the frequency and the time of sweeping and scrubbing the following:

	SWEEPING		SCRUBBING	
	Frequency	Time	Frequency	Time
Halls 3	Daily, nightly	10:00 P.M.		
		6:00 A.M.	Once a week	
Rooms	Daily, nightly	10:00 P.M.		
		6:00 A.M.	Once a week	
Basement	Daily	2:00 P.M.	Daily	2:00 P.M.
Toilets-3	Daily	2:00 P.M.	Daily	2:00 P.M.
Sidewalks-3	Daily	9:00 P.M.	Daily	Morning

Under frequency state whether daily, weekly or monthly
Under time give the time of day when the above work is done.

2. How often are windows washed? Five to six times a year.

3. What repair work does the janitor do? Fix seats and doors.

4. Name, position, duties and hours of each employee:

Name	Hours	Duties
John Mott	8	Chief Janitor
Fred Mees	8	Assistant chief janitor- five rooms, four toilets, two halls
Ray King	8	7 rooms, 2 halls, 4 toilets
Frank Matsinski	8	7 rooms, 1 hall, 2 stairs
August Poike	8	6 rooms, 1 hall, 2 stairs
Eva Drake	8	6 rooms, dust all halls, stairs
Anna Mesch	8	6 rooms, dust all halls, stairs
Belle Hewit	8	8 rooms, two halls, 2 stairs
Pauline White	8	9 rooms, 2 halls, 2 stairs
Alfred Heft	8	8 rooms, 2 halls, 1 stair
Wm. Quirk (Cass Annex)	8	16 rooms, 4 stairs, 2 entrances

Examining the schedule of the Cass High it is seen that the janitor in the Cass Annex, himself, takes care of sixteen rooms and two stairs in addition to firing two furnaces, while the maximum work done by any one of the other men is to take care of seven rooms plus two halls and four toilets. Upon a visit to the Cass High School, it was learned that one of the men had seven rooms, all of them workshops, to each of which was allotted thirty minutes for cleaning; a total of three and one-half hours. This leaves four and one-half hours for cleaning the two halls and the four toilets or the one hall and the two stairs.

Aside from cleaning and dusting rooms, halls and stairs and scrubbing the toilets daily, the other work is scrubbing rooms and halls from once every week to "whenever it is necessary", and washing the windows inside and out as a rule three or four times a year. Some janitors stated that they washed them five or six times a year.

All the help comes on during the day, anywhere from seven to nine in the morning, working until four or five in the afternoon. Since most of the class rooms are occupied from nine in the morning until three in the afternoon, the janitors and cleaners must confine their labor to the halls, toilets and to the walks, and there is not enough of this work to keep from eight to fourteen persons busy in a high school during these hours. The problem resolves itself to organizing the staff so that only as many janitors as are necessary to care for the halls, toilets and walks come on

early in the morning, and that the rest report for duty when they can work uninterruptedly in caring for the class rooms. An opportunity for continuous work will undoubtedly result in a reduction of the cleaning staff.

Bearing in mind that the class rooms of the schools are standardized, in so far as the furniture is concerned, and that the main part of the daily work is sweeping and dusting, it is interesting to note the work done in commercial buildings and the number of persons employed to do it.

Janitorial Work in Office Buildings

In one office building investigated, it was found that one woman in six hours a day takes care of forty rooms. It is true that these rooms are smaller than the school rooms, but in size they will equal at least fifteen school rooms, if not twenty. It must, however, by borne in mind that every office is furnished differently; that the furniture is more expensive than found in school rooms, and must be handled more carefully; that there are desks, and chairs, and filing cases, and book-cases and books and papers on these desks. In addidion, many of the offices have rugs. Taking care of these rooms comprises sweeping the floors, dusting all the furniture in the room carefully, mopping the floors as often as is necessary,- an operation necessary at least three times a week and very often every day, because traffic in the offices continues throughout the day and dirt and mud from the streets accumulates.

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The halls and stairs of this building,- the area of the former alone being 33,000 sq. ft.- are taken care of by four men,- one man being given four floors with the stairs in between . This means cleaning daily the wash rooms on each floor and the toilets on every other floor, washing the transoms periodically, cleaning the cuspidors every day and polishing them,- over 200 - every two weeks. The floors are scrubbed daily, because, as was noted above, the traffic is continuous. In addition to this work these four men are used for moving furniture and doing all the handy work necessary around the building.

For cleaning windows special men are hired who do nothing else, but one man cleans from fifty-five to sixty-five windows every day, a fact which gives an idea of how long it would take to clean the school windows. The cost of janitorial service for this sixteen-story building is $9,000 a year; the cost in the high schools runs from $7,586.64 in the Western to $10,502.96 in the Central High School.

From a standpoint of cost, another office building of 145,000 square feet cleanable area, was investigated and it was found that the cost was $10,500 a year. This included among other work.

Washing 800 windows once every ten days
Washing the walls once a year
Cleaning and dusting and mopping 120,000 square feet of offices six nights a week.

The halls and stairs of this building,- the area of the former alone being 33,000 sq. ft.- are taken care of by four men,- one man being given four floors with the stairs in between . This means cleaning daily the wash rooms on each floor and the toilets on every other floor, washing the transoms periodically, cleaning the cuspidors every day and polishing them,- over 200 - every two weeks. The floors are scrubbed daily, because, as was noted above, the traffic is continuous. In addition to this work these four men are used for moving furniture and doing all the handy work necessary around the building.

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Washing 800 windows once [illegible] days
Washing the walls once [illegible]
Cleaning and dusting [illegible] [illegible],000
square feet of offices [illegible] nights a week.

Scrubbing and mopping 25,000 square feet of marble corridor six nights a week
Washing transoms and glass doors at least once a month
Rubbing and polishing wood work at least three times a year

In addition to this there is the usual cleaning and polishing of cuspidors, scrubbing toilets and wash rooms, cleaning elevators, grill work, stairs, etc.

Omitting consideration of the rate of pay and thinking only of the number of persons employed and the relative kinds of work done, the above comparison reveals the need for a reorganization of the janitorial work in the schools, if it does not conclusively show that too much help is being employed to take care of the high schools.

Rates of Pay for Engineers and Janitors

It is not intended in this report to suggest what constitutes an equitable rate of payment for janitors and engineers. The problem of just salaries and wages in any line of work is one which is, quite apparently, far from being decided. The best that can be done here is to show by comparison whether or not the prevailing rate of pay in Detroit is high or low, and to suggest means by which an equitable salary for the services may at least be approached.

To compare the Detroit salaries for engineers and janitors with those paid in other cities leads to complications, because living conditions and other circum-

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To compare [illegible] or engineers and janitors with those [illegible] leads to complications, because living conditions and other circum-

stancew which must be considered in fixing the salary differ in every city. In fact, it seems that one of the most difficult problems school boards have to meet, is the determination of proper salaries for janitors and engineers, because no two cities have the same basis for payment, nor do they apply the same procedure in the operation of their buildings. In one city, all the work is done on a contract basis, - each school being let on an individual contract; in other cities, the operation of all of the school buildings is let on one contract; still in other cities, the board of education itself hires every person who is connected with the operation of school buildings; while another method is a combination of contract and direct labor or a semi-contract basis. Theoratically, the Detroit Board of Education follows the last named course in the operation of its steam heated elementary schools. The unit of operation varies in every city. Although the methods in the operation of buildings are becoming more and more standardized every year and high salaried superintendents are employed in all the large office buildings of the country as professionally qualified for the work. The idea of standardizing the care of school buildings and standardizing units of payment has made very little progress with the boards of education throughout the country. Altho studies have been made and are being made of the question in various cities of the United States, yet no plan has been developed which is recognized as the best or

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as the standard plan.

Why the school building should not be operated with as great economy as the office building cannot be answered satisfactorily unless it be the age-old reply which simply takes it for granted that city business cannot be done as efficiently and at the same time as economically as private business. The amount appropriated in operating the school buildings in Detroit for the year 1916-1917 is $ 415,153,13. At a conservative estimate, it is believed that if the operation of the schools were conducted on the principle of getting as much service for every dollar as should be reasonably received, the cost of operating Detroit school buildings could be reduced by $75,000 a year.

Without setting up the salaries paid the janitors and engineers in private office buildings in Detroit as standards to be followed, but rather with a view to showing how such labor is rated, there will be given in a subsequent section of this report the salaries paid in a few of the leading office buildings of this city, for work which was enumerated in the last preceding section.

The schedule employed for the payment of janitors and engineers in the Detroit schools, follows:

Elementary Schools Steam Heated.

Engineer - Six-room school used as basis,- $102.48 per month for twelve months. For each room additional, $1.46 per month for twelve months, is added. This schedule apparently considers a 24-room building the

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maximum size for an elementary school, as highest salary paid engineers in elementary schools is $127.38 per month.

Janitor — $5.32 per month per room for ten months a year. The minimum salary paid is $50.00 per month for full time janitorial work in an eight room school. A cleaner for part of the day is employed in the six-room school. The maximum salary paid under this schedule is $127.68 per month for a 24-room buildimg.

Elementary Schools on a High School Basis.

Engineer — The schedule for engineers seems to break down because it is found that the chief engineer in the Fairbanks School of twenty-rooms, receives $134.68 per month, while the engineers of the Norvell and Joyce Schools also 26-room buildings, receive $130.29 per month; in the Russell School of 25-rooms, the engineer receives $146.41 and the engineer of the Moore School, 25 rooms, receives $128.83 per month; the engineer of the Bishop School, 29 rooms receives $146.41

Firemen — $79.86 per month for twelve months.

Chief Janitor — $99.82 per month for twelve months.

Assistant Janitor — $79.86 per month for twelve months.

Cleaners (Female) — $53.24 per month for ten months.

High Schools

Chief Engineers — $126.41 per month for twelve months.

Assistant Engineers — $102.48 per month for twelve months.

Firemen — $79.86 per month for twelve months.

Chief Janitor — $99.82 per month for twelve months.

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Assistant Janitor	$79.86 per month for twelve months
Cleaners (Female)	55.24 per month for ten months

Elementary Schools Furnace Heated

What the underlying schedule upon which is based the pay of the janitors in these schools could not be found, but following are the salaries paid for the various sized schools:

6 rooms - $79.86 per month for twelve months
8 rooms - $86.61 per month for twelve months
12 rooms - $106.48 per month for twelve months
13 rooms - $113.13 per month for twelve months

The Washington School which has 24 rooms is operated by a janitor, assistant janitor and a cleaner, who receive the same salaries as similar employes in high school

a. Engineers' Salaries

Obviously, more work is required to operate the heating and ventilating plant of a 26 room building than that of a six-room building, but irrespective of the size of the plant, it is reasonable to expect a full days work from an employee during these hours in which he is employed. Any one acquainted with the work of stationary engineers knows that to take care of a heating plant for a six-room building for which there was delivered 72 tons of coal for the year 1915-16, does not represent a day's work for an engineer. In fact the engineer does not know that he is working. But for this day's work, he receives $102.48 per month, a wage

Assistant Janitor — $79.86 per month for twelve months

Cleaners (Female) — $8.24 per month for ten months

Elementary Schools, Furnace Heated

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a. Engineers' Salaries

Obviously, more work is required to operate the heating and ventilating plant of a 36 room building than that of a six-room building, but irrespective of the size of the plant, it is reasonable to expect a full day's work from an employee during those hours in which he is employed. An one acquainted with the work of attendants or cleaners knows that to take care of a heating plant for a six-room building for which there was delivered 72 tons of coal for the year 1915-16, does not represent a day's work for an engineer. In fact the engineer does not have to be working. For this day's work, he receives $106.48 per month, a wage

considered liberal and one which more than meets the prevailing rate of pay for such labor in Detroit. Even in the largest of the elementary schools where 500 tons of coal are consumed during the year, one stationary engineer can operate the plant without being imposed upon. Therefore, to pay an engineer of a 26-room building on a basis proportionate to the salary of an engineer in a 6-room building, when the salary of the latter in itself is more than good and exceeds the prevailing rate paid, and when the former even in his big school has no more than a day's work, is carrying the schedule to an absurdity.

Summarizing the problem which confronts the Board of Education in the payment of engineers in elementary schools, and this includes those schools on a high school basis, it is found that:

1. At least one man must be employed to operate the plant of even the smallest school
2. Under a city ordinance, an engineer with a first class license must be employed
3. There is a definite minimum salary for which an engineer can be employed
4. There is not sufficient work in the smaller schools in engineering duties alone to keep a man even reasonably occupied during his hours of employment, and therefore, the salary paid seems unjustified.

To solve this problem equitably for all parties concerned, it is necessary first, to decide upon a fair salary for engineers according to the prevailing rate in Detroit, and secondly, to demand of the engineers a full day's work for the salary paid them. In other words, it

means giving the engineers what is due them, and asking that the engineers give the Board of Education what is due it, In deciding upon a fair wage, those positions must be considered in which the engineers perform a full days's work. Sufficient examples of this kind can be found in the office buildings and industrial plants of Detroit.

There is one important difference between engineering work for the Board of Education and that for private institutions. In the latter, the plants are operated on full time for twelve months of the year, and engineers must work continuously during those months, usually without any slack season. Power for the plants must be furnished every week in the year and every day in the week. In office buildings there is no let up. In manufacturing plants there may be some during dull periods. Under the organization of the Board of Education, however, engineers do practically nothing for the two summer months, and find their duties considerably lightened during the early Fall and late Spring months. This point is brought out because engineers refuse to perform any other duties in connection with the care of the building except operating the heating plant.

Under the conditions prevailing in the Board of Education where no work is demanded of the engineers during a considerable portion of the year, it is reasonable to ask that during those months when school is in session, engineers perform such duties as are necessary for the proper care of the building and for which they have time at their

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disposal. With this idea in mind, it is suggested that engineers in all elementary schools be made responsible for the entire care of the building, and in so far as their duties and the size of the building permits, they shall themselves take care of the building. Advancing gradually in the size of the buildings, the engineering duties will increase, necessitating a reduction of the janitorial functions on the part of the engineer and the employment of additional help for these purposes. The manner by which the amount of extra help necessary for a school may be determined, will be discussed in later sections of this report. At present we find the cost of operating school buildings as follows:

Table Showing Monthly Costs of Operating Elementary School Buildings of Various Sizes.

No. of Rooms	Engineers' Salaries	Janitors' Salaries
6	$102.4. per month	$31.94 per month
8	105.41 " "	50.00 " "
8	105.41 " "	60.00 " "
10	108.30 " "	53.24 " "
12	109.88 " "	63.84 " "
14	112.72 " "	74.48 " "
16	115.65 " "	85.12 " "
18	118.59 " "	94.70 " "
20	121.51 " "	106.40 " "
22	124.44 " "	117.04 " "
24	127.38 " "	127.68 " "

Table Showing Cost of Operating Elementary School Buildings on a "High School Basis"

No. of Rooms	SALARIES Engineers'	Firemen	Janitor	Ass't. Janitor	Cleaner
24	$128.83	$79.86	$ 99.82	$79.86	$53.24
25	128.83	79.86	99.82	79.86	53.24
26	130.29	79.86	99.82	79.86	53.24
26	134.68	79.86	99.82	79.86	53.24
29	146.41	2 @ 79.86	99.82	2@ 79.86	2@ 53.24
Fresh Air School					
25	$146.41	2 @ $79.86	$99.82	2@ 79.86	2@ 53.24

If the replies to a questionnaire sent engineers is to be taken as authoritative, it is only in a few instances that any janitorial work is done by engineers. In all schools, full provision is made for janitorial service by hiring janitors, and from the smallest elementary school to the largest, they are paid for every room in the building, leaving engineers free from this work.

Table Showing Monthly
Costs of Operating Ele-
mentary School Buildings
of Various Sizes.

No. of Rooms	Engineers' Salaries	Janitors' Salaries
6	$102.4. per month	$31.94 per month
8	105.41 " "	50.00 " "
8	105.41 " "	60.00 " "
10	108.30 " "	53.24 " "
12	109.88 " "	68.84 " "
14	112.72 " "	74.48 " "
16	115.65 " "	85.12 " "
18	118.59 " "	94.70 " "
20	121.51 " "	106.40 " "
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Operating Elementary School
Buildings on a "High School
Basis"

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26	130.29	79.86	99.82	79.86	53.24
26	134.68	79.86	99.82	79.86	53.24
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There appears to be a strong conviction among the Board of Education officials that it will be impossible to obtain engineers who will be willing to perform any janitorial duties during such time of the day as can be spared from the operation of the heating and ventilating plant. This matter has never been forced to an issue by the Detroit Board of Education, but there is no reason for believing that the Board cannot obtain engineers who will be ready to accept positions in which permanent and even life employment with good pay is assured whether times are prosperous or dull; in which the amount of work in the boiler room during the warm weather is reduced to nil, liberal vacations allowed, full time work only five days a week, and in which no more than an average of eight hours work a day under these conditions are required. It is only just to demand that engineers under the aforementioned circumstances perform whatever duties are required to care properly for a building. If the present employes of the Board are averse to extending their functions, it is believed that sufficient willing candidates can be secured.

Chief engineers in high schools, responsible for big plants, should of course receive more money than engineers in the elementary schools, but for this money they themselves should be directly in charge during one shift doing actual work, thereby eliminating one of the assistant engineers who is superfluous while the chief engineer is on duty.

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Chief engineers in high schools, responsible for big plants, should of course receive more money than engineers in the elementary schools, but for this money they themselves should be directly in charge during one shift doing actual work, thereby eliminating one of the assistant engineers who is supervising while the chief engineer is on duty.

b. Salaries of Firemen and Coal Passers

The monthly salary of $79.86 per month paid firemen or coal passers, seems high because these men have no license and are therefore practically unskilled day laborers. For the amount paid them, men with a second class license, who must understand the mechanics of a boiler, can be secured and it is suggested that this be done because they can be left, with safety, in the engine room during the little time that the engineer spends in making his rounds of the building.

c. Salaries Paid in Commercial Buildings

Salaries paid in private buildings are, in proportion to the labor and responsibility involved, lower than the salaries paid by the Board of Education.

The chief engineer of one high pressure plant of 750 H.P. running 24 hours of the day, seven days a week, and consuming fifteen tons of coal daily, receives $150 per month; the assistant engineers $100 and firemen $80. Coal passers receive less.

In another plant of 1400 H.P. which consumes 10,000 tons of coal a year and where is produced over 100,000 kilowat hours of power a month, the chief engineer receives $200 per month, conceded to be an exceptional salary. The assistant engineers are paid $100 and firemen $80.00.

A third plant for one of the large manufacturing establishments, where there is a boiler capacity of 2100 H.P. operated every day in the year, 24 hours a day, or where

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A third plant for one of the large manufacturing establishments, where there is a boiler capacity of 3100 H.P. operated every day in the year, 24 hours a day, or more

sixty tons of coal are consumed daily, the chief engineer receives $150 per month.

In all of these plants the men work every day in the week and every week in the year. There are no slack periods as are found in the schools.

It is not being urged that engineers be worked to the limit of their energy, nor that they be paid less than a fair living wage, but it is urged that the Board of Education should not pay wages greatly in excess of the prevailing market rate for work to be performed. In passing, the opinion is noted that the organized community should be the most liberal employer, demanding however, that the employe give service commensurate with his pay.

d. Janitors' Salaries

There seems to be greater discrepancy between the salaries paid for janitorial service in the schools and those paid in private buildings, than there is for engineering service. In office buildings, male janitors are paid from $50 to $60 a month for eight hours work, six days a week, and women are paid from $30 to $40 a month for six hours work a day, six days a week. For these salaries, as was stated in the preceding section, four men in one building take care of thirty-three thousand square feet of actual hall area, besides stairways, toilets and washrooms, cleaning and polishing of cuspidors, and general handiwork about the building. In short, there is sufficient work to keep them busy eight hours a day. The women, in six hours a day take care of at least eight thousand square feet of actual

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office area, sweeping, dusting and mopping. The Board of Education, on the other hand, pays the assistant janitors $79.86 and the women $53.24 a month.

The salaries paid in private institutions are not proposed as standards, but they give an idea of the kind of wages paid by the Board of Education for the work which does not seem as arduous as that necessary in office buildings. Whether $5.32 per month per room for janitors in the elementary schools is excessive cannot be stated definitely, but it is certain that paying this rate for janitor service in addition to the liberal salaries paid engineers in the same schools, brings the rate of pay for operation of a building up to a point which is excessive.

There is in the school system itself a basis of comparison which indicates how much work can be obtained for salaries paid. The janitors in furnace heated schools, in addition to cleaning the buildings, take care of from three to nine furnaces, depending upon the size of the school. It is interesting to compare in the following table, the rate of pay for operating those schools with the amount paid to operate steam heated schools containing the same number of rooms:

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Table Comparing the Salary Cost for Operating Furnace Heated Schools with the Salary Cost of Operating Steam Heated Schools of the Same Size.

No. of Rooms	School	Total Salaries for Operation per Month	Total Salaries for Operation per Month in Steam Heated Schoo
2	Custer	$53.24	
6	Bagley	79.86	$134.43
6	Bellefontaine	79.86	
6	Potter	79.86	
8	Brownson	86.51	155.41
8	Roberts	86.51	
8	Hubbard	86.51	
8	Jackson	86.51	
8	Clay	86.51	
8	Dickinson	86.51	
8	Preston	86.51	
12	Everett	106.48	173.22
12	Wilkins	106.48	
12	Ferry	106.48	180.00
12	Williams	106.48	
13	Berry	113.13	
*24	Washington	232.92	255.06

*Janitors, assistant janitors, and cleaners.

e. Room as Unit Basis for Payment

To use the room as a unit for paying janitors results in equitable salaries for this work in different schools. Neither are all the rooms in the same school nor the rooms of any number of schools equal in size, nor is the average room of different schools the same size. Furthermore, there arises always the question of what is to be considered a room for payment, as various types of rooms and offices are added from time to time. Another factor which is overlooked under this method of payment, is the general condition of the school itself, and the neighborhood in which it is located. Schools which are in residential districts and away from factories and railroads would appear to gather less dirt than schools located

in smoky districts. Also schools located in the sections where there are bad street conditions would appear to be more difficult to keep clean because of the mud and dirt which the children bring in with them. In other words, every school is a problem in itself, and it should be determined how much time and labor is necessary to keep each school clean.

9. REDUCTION OF STAFF DURING THE SUMMER MONTHS

At the present time, the full complement of janitors and engineers is employed during the vacation period with the exception of the janitors in the steam heated elementary schools and the women cleaners in the high schools and in the elementary schools on a high school basis. Apparently, the elementary schools in which janitors are laid off for the summer do not suffer because of this practice. It is reasonable to suppose, therefore, that the larger schools would not suffer if at least a part of the superfluous staff during these months, when no work is done, would be laid off. Reference is here made to the assistant janitors, assistant engineers, and firemen in the high schools and elementary schools on a high school basis. It is desirable to retain those persons who are responsible for the operation of the buildings, as the engineers in elementary schools, janitors in furnace heated schools and chief janitors and chief engineers in high schools, but the other employes who work under the orders of the before mentioned persons and who constitute a class of labor which can be obtained

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whenever necessary, can be laid off, it seems without detriment to the schools and with the result of large savings which can be applied directly to the school facilities of which Detroit seems to be in such urgent need. Last summer the Supervisor of Property used firemen and coal passers for work on school property for which otherwise additional help would have been needed, thus saving the Board of Education over $60 a day. This saving, of course, was effected because the fireman and coal passers were being paid whether they worked or not. In those instances where men are given special work during the summer, it is suggested that the pay be governed by the work done and not by the salary received at the regular jobs.

If it is fair to discontinue the services of professional employes who receive, after a training of years, an initial salary of only $50 a month for the months employed, it seems fair to lay off, without pay, ordinary laborers.

The following shows the difference between the actual payroll of the summer of 1916 and the proposed payroll - i.e. discontinuing for two months the services of all assistant engineers, assistant janitors and firemen, and chief janitors in elementary schools on a "high school basis" junior high schools:

Payroll - summer 1916	.....	$42,676.44
Proposed payroll	.....	27,769.48

10. Use of Coal in Schools

One factor which aids largely in measuring the efficiency of an engineer is the amount of coal he uses in maintaining heat and power in the school. The most efficient engineer is he who maintains the required standard of heat and power with the minimum consumption of coal. While the construction and condition of the building is a factor to be reckoned with in keeping it heated at the required temperature, the coal deliveries to the various schools during 1915-16 set forth in the following table, indicate that the matter of coal consumption needs close inspection and supervision in order to reconcile the apparent inequalities in the amounts of coal consumed by the various schools.

Table Showing Coal Received by Schools compared to heat load of the school measured in equivalent of sq. ft. of radiation.

No. Rooms	School	Total Sq.Ft.in equivalent of 2 Col.C.I.Radiation	Tons Coal Received 1915-16
18	Barstow	14,135	223
17	Beard	14,291	187
18	Burton	13,320	223
20	Clippert	13,385	187
*16	Dwyer	13,635	172
16	Field	13,090	205
16	Gillies	18,185	104
15	McGraw	11,400	172
19	Marcy	13,320	143
18	Owen	8,182	167
18	Palmer	14,220	311
23	Webster	19,705	277
31	Fairbanks	25,022	512
	Furnace Heated Schools		
8	Brownson	3,110	103
8	Jackson	3,458	75
8	Everett	3,995	113
*12	Dickinson	3,268	94

*Evening school sessions held in these schools.

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No. Rooms	School	Total Sq. ft. in equivalent of 2 Col. C.I. Radiation	Tons Coal Received 1915-16
16	Barstow	[illegible]	[illegible]
17	[illegible]	[illegible]	[illegible]
18	[illegible]	[illegible]	[illegible]
20	Clippert	[illegible]	[illegible]
15	Dwyer	[illegible]	[illegible]
16	[illegible]	[illegible]	[illegible]
16	Gillis	[illegible]	104
15	[illegible]	[illegible]	[illegible]
14	[illegible]	[illegible]	[illegible]
13	[illegible]	[illegible]	[illegible]
10	[illegible]	[illegible]	[illegible]
22	[illegible]	[illegible]	[illegible]
31	[illegible]	[illegible]	[illegible]
	[illegible]		
8	Brownson	[illegible]	[illegible]
8	[illegible]	[illegible]	
8	[illegible]	[illegible]	[illegible]
12	[illegible]	[illegible]	[illegible]

Evening school [illegible] in these schools.

The Business Manager made a beginning in the control of the use of coal by having submitted to him periodically the amount of coal secured by each school. Full benefits from such reports could not be derived unless the information furnished was followed up by an engineer capable of making a study of each case and finding out the reasons for such conditions as are set forth in the above table.

Basing a comparison of coal consumption upon the "heat loads" of the various schools as computed scientifically by the consulting engineers of the Board of Education, it is found that large discrepancies exist in the coal used. For purposes of illustration, the elementary schools listed in the above table were chosen. Among the most striking facts in the table is the Palmer school which has a heat load equivalent to 14,220 sq. ft. of radiation, but received three times as much coal as the Gillies school which has a heat load equivalent to 18,185 sq. ft. of radiation. No less glaring is the fact that nine of the listed schools with heat loads varying from 44 to 77% of the heat load in the Gillies School received from 26 to 300% more coal than the latter. The Dwyer School, in spite of a heat load larger than the Burton, Clippert, Field and McGraw Schools, in spite of the use of coal for evening school, received less coal than the first three mentioned and the same amount as the McGraw. Note that the heat load of the McGraw is 85% that of the Dwyer. When compared to a school as the Webster, which seems to have a liberal amount of coal to its credit, the annual tonnage of the Fairbanks school

appears excessive, and when compared to the Gillies School, the showing of the Fairbanks looks exceedingly poor.

Among the four furnace heated schools chosen as illustrations in the foregoing table, apparent discrepancies in coal received as compared to the heat load of the building, also manifest themselves.

To what causes should be attributed such discrepancies in coal consumption cannot be stated merely by a study of figures. It is sufficient to note here that there is an apparent waste in the use of coal, and that this problem is of such import as to merit an intensive study by a qualified engineer. In no other way does it seem possible to eliminate the causes of excessive coal consumption.

11. USE OF SUPPLIES BY JANITORS AND ENGINEERS

In the year 1916-17, $8500 was appropriated for janitor and engineers' supplies. The amount of janitorial supplies used by the individual schools for the year 1915-16 on a room basis varied from $ .35 to $10.17 per room per year. The average consumption was $3.46; 43 elementary schools went above this while 66 schools spent less than this amount.

This wide variation in consumption of janitors' supplies indicates that a more careful control may reduce the quantities of supplies used. The Business Manager has inaugurated a control of the use of implements, such as brooms, shovels, etc., by refusing new ones unless the old

appears excessive, and when compared to the Gillies School, the showing of the Fairbanks looks exceedingly poor.

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This wide variation in [illegible] supplies indicates that a more careful control may reduce the quantities of supplies used. The Business [illegible] inaugurated a control of the use of implements, such as brooms, shovels, etc., by [illegible] how [illegible] unless [illegible]

ones are returned and are found to be worthless.

In the use of sweeping compound alone more than a few hundred dollars might be saved if it is found practicable for the Board to buy the sawdust and to prepare its own compound. At the present time $1.33-1/3 per hundred weight is being paid for a prepared compound, of which it is estimated 1185 cent will be needed during the present year, costing $1580. A possible saving of 75% has been estimated by the Superintendent of one of Detroit's office buildings, if the sweeping compound is prepared by the Board of Education.

12. PAY FOR CARE OF SUMMER PLAYGROUNDS & EVENING RECREATION CENTERS

During the summer of 1916, the Recreation Commission maintains playgrounds on school property. Last summer there were 38. The daily sessions of these playgrounds are held from 12 to 8 P.M., during which time the basements of the schools were opened for convenience of the children attending the playgrounds. In order that the school property might be guarded properly, an employee of the Board of Education, usually the engineer of the school, remains in the building until 8 P. M. and locks the building for the night. It is the duty of this caretaker merely to see that the children do not violate school property. The regular hours of the engineers in these schools is from 8 A.M. to 4 P.M., therefore, necessitating four hours overtime on the part of the engineers. For these four hours, they were paid

$1.50 a day for 60 days which comprised the playground season, the total amount of salaries paid out last summer for this purpose being $3,585. Upon the resolution of the Board of Edudation, which was passed near the end of the summer 1916, the Recreation Commission will be obliged to pay for 1917 $2.25 a day for the four hours overtime, totaling $5,265, if the same number of playgrounds are maintained during the summer of 1917.

It is not intent here to pass judgement upon the justice of paying $1.50 or $2.25 for four hours of watching the building, altho it may be noted that $2.25 for this work is more than reasonably good. It is intended, however, to comment upon an expenditure of $5,265 which could be saved to the city without injustice to anybody concerned. It is true that the money paid engineers for this purpose does not come from the funds of the Board of Education, but it is also true that the funds come from the city taxes, the same source from the Board of Education derives its funds. This fact would seem to inspire the same care for economy in the expenditure of this money in the members of the Board of Education as seems to be felt by them in expending the funds appropriated directly to the Board.

During the summer, the engineers in the schools have absolutely nothing to do, and with no duties , there seems to be no need for their attendance at the school at any specific eight hours during the day. The interests of

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During the summer, [illegible] have absolutely nothing to do, and with no duties, there seems to be no need for their attendance at the school at any specific eight hours during the day. The interests of

the Board of Education would be just as well guarded and preserved if the engineers were present at the school building from 12 to 8 P.M. daily, instead of from 8 A.M. to 4 P.M. daily. By having engineers commence their day at noon during the summer they would be present during the eight hours when the playgrounds are in session, thus obviating the need for four hours overtime, and the resultant extra pay.

In this connection, it is especially interesting to note that in the following schools,- Bishop, Garfield, Norvell, Russell, and Northwestern High, where playgrounds are maintained, the Board of Education retains a staff of janitors and engineers in each of the schools of at least four persons,and as many as thirteen on full pay during the summer months without any work to do. This is not stating it too strongly, because all of these schools are elementary schools on a high school basis, or high schools where chief janitors and chief engineers and assistant janitors and assistant engineers are employed for twelve months a year.

A somewhat similar condition exists in the evening recreation centres. The Recreation Commission maintains 25 play centres in 25 schools where the Board of Education, at the same time, conducts evening schools. The Engineers in these schools receive $2.00 per night from the Board of Education for their service until 9 P.M. and as the play centre is open until 10 P.M. and additional dollar is paid engineers by the Recreation Commission for this extra hour.

It seems that for the $2.00 received by the engineer he may reasonably be expected to remain in the building until 10 P.M. This extra hour's pay costs the city of Detroit approximately $2400 a year.

1. SUGGESTED CHANGES

a. Appointment of a Chief Engineer

For building up an efficient corps of engineers and janitors who will properly take care of the expensive plants of the Board of Education, to derive the maximum benefits from the modern heating and ventilating systems in the schools, the primary requisite is the appointment of a chief engineer who will be responsible for this branch of the service.

It is recommended that for this purpose a mechanical engineer be secured with experience in heating and ventilation. If as his assistant, when one is necessary, a young sanitary engineer could be secured, the operation of buildings would be in charge of a well-rounded executive staff who should be able to give proficient direction to the heating, ventilating, and general sanitary conditions of the schools.

b. Appointments and Dismissals

For the present and immediate future no new men need be appointed, because a reorganization of the service and a reassignment of duties will probably result in creating a considerable number of superfluous engineers and janitors, who can be appointed to new schools. But when new men are required, it is recommended that the candidates for all positions in this branch be selected from lists prepared by the Civil Service Commission, which acts as the employment agent of the city, assuming that the Civil Ser-

[illegible] SUGGESTED [illegible]

a. Appointment of a Chief Engineer

For building up an efficient corps of engineers and janitors who will properly take care of the expensive plants of the Board of Education, to derive the maximum benefits from the modern heating and ventilating systems in the schools, the primary requisite is the appointment of a chief engineer who will be responsible for this branch of the service.

It is recommended [illegible] local engineer be secured [illegible] ventilation. If [illegible] young [illegible] engineer [illegible] buildings [illegible] staff who [illegible] the heating, [illegible] of the schools.

b. Appointments [illegible]

For [illegible] need be [illegible] and [illegible] ing a considerable [illegible] tors, who can be [illegible] me [illegible] all posit[illegible] pared by the Civil Service Commission, [illegible] employment [illegible] city, [illegible]

vice Commission can and does revise its policy of certifying only one name for appointment. This will serve the twofold purpose of relieving Board of Education officials from the continual pressure brought to bear upon them to appoint persons to jobs, and will free the administrative officers from the task of looking for candidates.

The above recommendation is made with the reservation that the chief engineer will have the right to refuse undesirable candidates sent him or to dismiss them any time during the probation period without restrictions, beyond filing reasons for dismissal. It is extremely important that the Board of Education have an opportunity to pass upon the personal qualifications of its janitors and engineers because of the contact with school children and teachers had by these employes. In fact, good character is the foremost requirement in hiring engineers and janitors for school buildings. The direct method of employment is suggested because the Board of Education can in this way pass upon all of the candidates, from chief engineers to cleaners.

In order to prevent future inconveniences in the service and complications for the Board of Education, it is desirable that employes be required to prove their physical fitness to do the work by submitting to a medical examination. Not long ago one of the janitors developed a hernia, claimed to be caused by his duties; whether he suffered from this before he entered the service was a question important to decide.

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c. Promotions

Promotion to better jobs can be used by the Board of Education as a means for increasing and maintaining efficient service. By transferring men from smaller to larger schools as vacancies occur and by promoting assistants to higher jobs, an incentive for doing good work will be created. Such incentive is lacking now because only in rare instances do promotions come to the existing staff. As a rule new men are recruited for vacancies and for the new schools, whether the vacancy is in a high school or in a small elementary school.

d. Supervision

It is recommended that the chief engineer be the executive head of this division of the Board of Education and that he and his assistant direct the work of engineers and janitors. This will include supervision thru instruction and thru regular visits to the schools.

Principals, as executive heads of the schools and responsible for the proper care of the buildings, can supervise in a negative way only - i.e. by inspecting the building and seeing that the rules governing the duties of engineers and janitors are carried out. Violations of the rules should be reported to the chief engineer.

e. Size of Staff for Each School

An effort was made in foregoing sections of the report that the number of persons employed in individual schools was too large, that there was no standard form of

of organization, and that the present organization of the work is such as to result in much unused time during certain portions of the day and a consequent excess of help for the amount of actual labor involved in operating a building not of the best. It was also suggested that a reorganization of the staffs in the schools and a reassignment of duties could result in a reduction of the number of persons employed without detriment to the proper care of buildings. As a basis for this reorganization it is recommended that a study be made by the chief engineer, to determine

> The maximum amount of work an engineer can do in eight hours in operating a heating and ventilating plant, measured in terms of coal handled, attention given to the plant, and such other basis as the chief engineer may deem practical
>
> How many hours, actually, need be spent by engineers in operating the plants in various sized schools
>
> How many hours a day an engineer can give to other duties such as cleaning. This of course presupposes sufficient time devoted to the heating and ventilating plant
>
> How much area the engineer can clean during these hours not devoted to the boiler room
>
> How many hours of additional help the engineer will require to clean the building
>
> How extensive an area of class room, hall, sidewalk and windows one man can clean in a qork day; one woman - restricted to indoor work
>
> During how many months of the year engineers in the larger schools need firemen to assist in the operation of the heating plant

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During what hours of the day cleaning can be done in the schools; whether cleaners shall be on duty from 8:00 A.M. to 5:00 P.M., or shall come on duty in the afternoon, so that the amount of time lost in waiting for classrooms to become vacant be eliminated.

For this study it is suggested that an 8, 14, and 26 room building be taken as a basis, and that a test crew be used consisting of an engineer, janitor, and janitress of average ability.

It is further suggested that there be made a distinct differentiation between the character of work to be performed by men, and that to be demanded of women; that wherever women can be used, it be done. It is uneconomical to pay men $79.86 per month for practically the same work the women are doing now in most instances for $53.24 per month.

It is believed that a maximum of five men is sufficient to operate the heating and ventilating plants of any of the high schools, if the staff is organized as per the following suggestion:

Morning watch	6:00 A.M.-2:00 P.M.	1 Engineer,	1 Fireman
Afternoon "	2:00 P.M.10:00 P.M.	1 "	1 "
Night "	10:00 P M.-6:00 A.M.	1 "	

f. Payment of Engineers and Janitors

It is not intended here to state what the rate of pay should be except that a fair wage be paid for the amount and nature of work to be done.

This rate, it is suggested, be decided after tests have been made of the amount of labor involved in oper-

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It is believed that a maximum or five men is sufficient to operate the heating and ventilating plants of any of the high schools, if the staff is organized [illegible] the following suggestion:

Morning watch-6:00 A.M.-3:00 P.M. 1 Engineer, 1 Fireman
Afternoon " -2:00 P.M.10:00 P.M. 1 " 1 "
Night " 10:00 P.M.-8:00 A.M. 1 "

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ating a building and of the character of the work essential to operate it properly. A suggested unit of payment is the heat load for the engineers and the square foot area for janitors. It may be found advisable or even necessary to vary the rate of pay for cleaning a square foot with the character of the building, determined by the age, construction and location of the school. Some schools are more difficult to keep clean than others, because of any or all three of these factors.

While the salaries paid in commercial buildings are not presented as standards of remuneration for such work, yet they may be taken as a guide in deciding how such labor is valued in Detroit. Another factor which enters into the situation of fixing a salary schedule at this time is the condition of the labor market in Detroit, in which, as it happens, desirable common labor is scarce.

Paying $2.00 per night to engineers in the high schools during those months when evening school is in session should be discontinued because the regular hours of duty include night work, and for this one salary is already being paid.

g. Classifying Buildings

For purposes of operating it is recommended that classifying schools as high or elementary be discontinued. Every building should be judged as so much space to be heated, ventilated and cleaned, and the number of engineers and janitors should be hired on the required amount of work

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Such classification will preclude an automatic increase of 100% in the staff of an elementary school, just because it has been classed as a high school, and not because 100% increase in the staff is a necessity.

In this connection, it is recommended that all the elementary schools on a "high school basis", be reduced to the same basis as the other elementary schools and that only the amount of help necessary to operate them be retained. This action will save over $20,000 without detriment to the schools in question.

h. School for Engineers & Janitors

There is a most efficient and a most economical method of cleaning and heating a building. It is recommended that such desirable methods be adopted as standards and that they be taught the engineers and janitors.

The plan of instruction may take the form of organizing the engineers and janitors in respective groups and teaching these groups the best way to do their work. Or else such instruction may be given by the Chief Engineer and his assistant to individual engineers and janitors when visiting the schools. The group method seems preferable because of the value to be derived from collective thought and suggestions when a number of individuals in the same line of work get together.

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ployes, and it was surprising to find how much wasted effort was being used even by the oldest employes in so apparently simple an operating as hand brooming.

j. Book of Rules

It is recommended that a book of rules be prepared outlining in detail the duties of engineers and janitors, and as far as is expedient furnishing instructions as to the manner in which they should perform their work. Not only will such book of rules be a guide to the engineers and janitors themselves, but it will serve as an aid to principals in seeing that their schools are properly cared for. They will know just what to expect of an engineer or a janitor and the latter will know just what is expected of them. Printed rules and instructions leave no opportunity for arguments.

k. Records

The following records to be kept in the Chief Engineer's office are suggested:

Daily report from engineers as to amount of coal consumed, heat maintained, etc.

Individual history card for each employe, upon which will be recorded a history of his service,- the favorable and unfavorable incidents.

Monthly report from storekeeper on amount of supplies issued to each school. This report in use now.

l. Repair Work

It is suggested that at some future date, after a reorganization has been affected, that plans be worked out by which the spare time of employes during school vacation periods be utilized on repair work.

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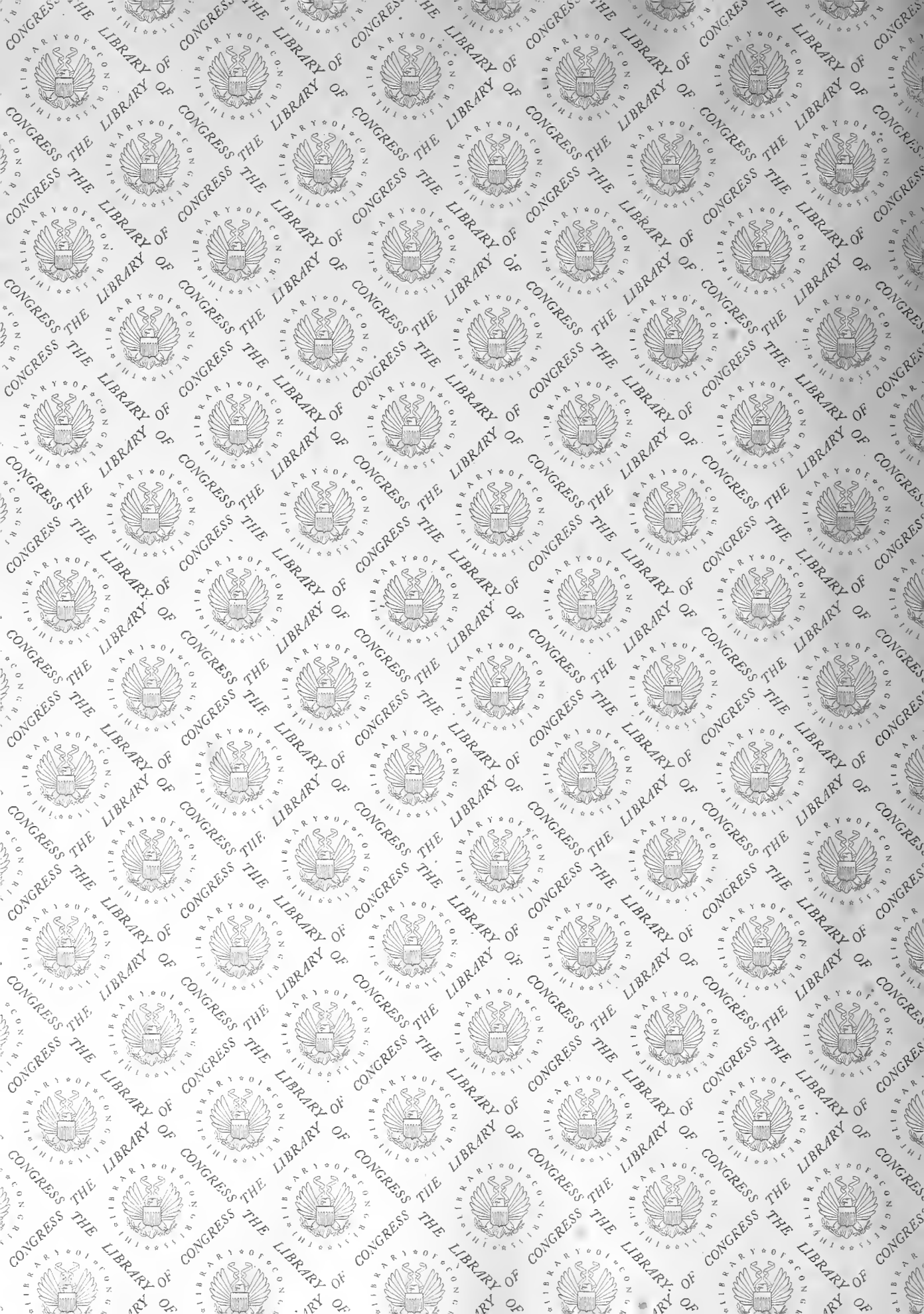
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